



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Journal of the Society of Arts.

FRIDAY, MARCH 2, 1866.

Announcements by the Council.

ORDINARY MEETINGS.

Wednesday Evenings, at Eight o'clock:—

MARCH 7.—“On the late Anglo-French Exhibition, with a Proposal for the formation of an Anglo-French Association.” By ROBERT CONINGSBY, Esq.

MARCH 14.—“On Visible Speech, or a Universal and Self-interpreting Physiological Alphabet. By ALEXANDER MELVILLE BELL, Esq., F.R.S., S.A. On this evening Alexander J. Ellis, Esq., F.R.S., will preside.

CANTOR LECTURES.

A Course of Lectures by Dr. F. Crace Calvert, F.R.S., will commence in April. Particulars will be duly announced.

NATIONAL PORTRAIT EXHIBITION, 1866.

Season Tickets for this Exhibition are now ready, and may be had at the Society of Arts, on application to the Financial Officer, price £1.

Proceedings of the Society.

MUSICAL EDUCATION COMMITTEE.

The Committee met on Wednesday, January 10th, 1866. Present—Henry Cole, Esq., C.B., in the chair, Sir John E. Harington, Bart., Messrs. S. Redgrave, R. K. Bowley, and R. F. Puttick.

MR. HENRY LESLIE examined by the committee:—

614. I believe, Mr. Leslie, you are the principal of the National College of Music?—Yes; during the time of its existence. It is about to be discontinued.

615. How long is that?—Two years.

616. It would appear from the prospectus that its aim was similar to that of the Royal Academy of Music?—It was instituted for the purpose of giving a musical education on the basis of the foreign Conservatoires.

616. Its aim was to teach music generally?—Yes.

617. Did the National College of Music rely wholly on the fees of the students for support?—Not at all.

618. Were there subscribers?—The main expense was undertaken for two years by the Marquis Townshend. It failed for want of funds, no one having come forward to assist financially upon the expiration of the guarantee of Lord Townshend.

619. Was there a great loss?—It was not a question of paying or not, but the giving of the best possible instruction. I had the power of granting any extra lessons I deemed fit to ensure the improvement of the pupils.

620. The point which the committee wish to arrive at is, assuming everything was done that was considered necessary by the principal and managers, what was the cost as compared with the results in that college?—There was a loss upon each pupil; a considerable loss upon some.

621. The Marquis Townshend himself stood in the place of a body of subscribers?—He undertook the whole expenses for two years.

621a. The Marquis Townshend having given it up, and no one coming forward to support it, it falls to the ground, unless the State or some other body comes in and takes the place?—Yes.

622. Did you find pupils in sufficient number in the National College of Music to call for the services of the very efficient staff of professors which you seem to have had?—We had only four violin pupils, all the others being for singing and the pianoforte.

623. You did not find many pupils for wind instruments?—There were candidates sufficient, though few showed the amount of natural talent which the council deemed necessary to entitle them to gratuitous instruction.

624. You did not admit them unless they showed some talent?—No; when we found decided talent, sooner than lose it, we educated it gratis during our existence. The greater number of the pupils we had could not afford the usual fee, viz., twenty-one guineas for the first class, and fifteen for the second.

625. You are of opinion that any institution of this kind to succeed must receive aid beyond the fees of the pupils?—Most decidedly.

626. And you found the pupils, generally speaking, persons who were not able to pay the fees required for their musical education?—Yes.

627. The answers you have given imply your agreement with the opinion that there is great necessity for a national academy of music in this country?—An absolute necessity, if music is to be cultivated as an art.

628. Have you had any personal experience with regard to the foreign conservatoires?—None at all.

629. Will you be good enough to favour the committee with your notions of what you would wish to see done by an academy of music?—On the question as to the necessity for a national academy of music I would say the establishment of such an institution could not fail to exercise an enormous influence upon the musical talent of the country, as it would be the means of enabling students to become something more than teachers. To accomplish the production of artistes a far greater amount of instruction and study is necessary than any existing institution can afford from the present scale of fees.

630. What do you consider the average period of time that a student should remain in the academy?—Five or six years.

630a. Will you proceed to give the committee your further notions of what the academy should be?—A national institution should be under the control of the Government. Individual responsibility should be the guiding principle. There should be a director appointed—a professional man—with supreme authority, responsible only to the Government or its representative. The director to appoint five chief professors, viz., for harmony and composition, pianoforte, stringed instruments, wind instruments, and singing, each responsible to the director for the management of his department. These five professors to appoint sub-professors in their respective departments. There should be instrumental and choral practice. A theatre should be attached to the institution in order to prepare students who intend going on the stage. Examinations should take place every three or six months, and pupils who have not made satisfactory progress should be dismissed. Musical degrees could be conferred by the academy.

631. You think the present system of conferring musical degrees wrong?—I do.

632. You would prefer that musical degrees should be conferred by a responsible musical academy?—By an academy which should be the centre of musical education in England. The general education of the pupils ought not to be neglected. In no case whatever would I allow a pupil to accept a single engagement during his term of pupilage, although there might be difficulty in carrying that into practice, because some of the pupils might not be able to maintain themselves without taking occasional engagements.

633. Having read the proposals that have been laid before the committee by Mr. Cole, will you be good enough to give the committee your opinion upon them?—With regard to the management of the institution, I would not have the lay element in it at all.

634. Except as paymasters?—I think it would be a bad principle.

635. If a liberal grant were made by the Government, it would be necessary that the Government should be in some way represented in the management of the institution and in the expenditure of the funds?—Yes, certainly; I see no objection to that.

636. Supposing Parliament granted an adequate sum of money, and entrusted its expenditure to a minister of the Crown, the minister might find it necessary to fortify his opinion by the advice of other parties who need not necessarily have a voice in the executive management, but would still be able to advise the representative of the Government whether the thing was going on rightly, he himself knowing nothing of the matter practically?—Yes.

637. There must be some control over the management not of a professional character?—To the extent you say. I can see no objection to such control.

638. Your opinion is that there should be individual responsibility in every department?—Yes; that should be the guiding principle in everything.

639. You have no doubts as to the benefits of such an institution?—Nothing satisfactory can be done without it.

640. You do not consider it creditable to the English nation to ignore music?—It is much to be deplored that the finest musical capabilities are thrown away for want of such an institution as there ought to be.

641. As regards musical artistes and the tuition of music generally, do you consider we are improving as a country, or getting worse?—With regard to tuition, I think we are improving; but, with respect to artistes, we are retrograding.

642. Notwithstanding the increasing demand the quality supplied is not of an improved character, you think?—Certainly not.

643. You attribute that to the want of a settled system of musical education?—Not altogether. Take, for instance, the case of a young man studying singing. The moment he is in a position to earn two or three guineas a week by engagements, his position is generally such that he is obliged to take them. It is almost impossible to hope for any artistic result in such a case. His education unfinished, his style is deteriorated, and the greater his musical capabilities the more serious is the danger.

644. It therefore becomes the more important, with an increasing demand on the part of the public for music, to take measures for creating a high quality and standard of music in this country?—Undoubtedly. It is my firm conviction that an institution carefully organized, and properly supported by the Government in England might be made the finest thing of its kind in the world. We have the best masters, and musical talent of a very high order; but it is frittered away in a deplorable manner, simply because there are no means of getting a really artistic education at a moderate cost.

645. You think music is not to be treated upon the ordinary principles of free trade—that it should educate itself?—Yes; music has been lowered from being completely ignored by the Government and being treated more as a trade than as an art.

646. Have you any acquaintance with the state of music in this country in the early time of Elizabeth?—Only from the compositions of the period.

647. Is it your opinion that composition has improved since that time?—Decidedly it has.

648. Are not the public importunate to get the best music they can, without taking pains to produce the very best?—They must take the best that is offered them.

649. You think musical ability is to be found in all parts of the kingdom?—Certainly.

650. You have had considerable experience in provincial associations for the practice of music?—Yes.

651. Do you think that those local societies could be brought into useful connection with the Academy?—I cannot say. The societies in question are of a choral character—as at Birmingham, Manchester, Bradford, &c. These may be a means of educating local talent, but great talent, wherever it exists, is sure to be brought forward through local connections of some kind or other. Almost all towns—indeed many villages—now have a choral society for the practice of music.

652. You would not bring them into connection with the academy?—I do not see any practical means of doing so.

653. You think without any such system you would get the talent?—I believe so.

654. Can you conceive the practicability of a system by which musical ability, not from a large town, but from a small town or village, could be sent up to the academy to be tested, and returned back if found wanting, and cultivated if found deserving?—There would be many more applications than could be taken.

[Mr. COLE explained the system pursued in this respect in the Training Schools of South Kensington, which, he said, after many years' experience, had worked extremely well.]

Mr. LESLIE—It is a question of detail which it is hardly necessary for me to enter into. Any facilities you give to persons to come up would increase the number of applicants.

655. Were you educated at the Royal Academy?—I was a private pupil of the present principal of the academy, Mr. Charles Lucas, and my father being a subscriber to the institution from its commencement, I used to take part in the practices of the students by invitation of the director.

656. Reverting to your own institution, should you say it was an experiment which proves the hopelessness of establishing such an institution without Government aid?—To my mind it demonstrated that no such institution, without Government aid, can fulfil the requirements of an English musical artistic education.

657. Do you think the English tax-payer would submit to the payment of an adequate grant from the public funds?—I must leave that to be answered by some one more experienced than I am in the ways of the individual in question.

658. You think private support of such an institution has been sufficiently tested?—I think quite so: such a system has been in vogue at the Royal Academy during forty-three years.

659. Yours was an experiment on a different principle, which equally proves the correctness of your opinion?—My opinion is formed upon the fact that the National College, instituted solely to aid talented and deserving persons, failed to elicit public sympathy and support.

660. Notwithstanding there is a growing demand for and appreciation of music throughout the country?—I should like to see six more tenors like Mr. Sims Reeves, and half-a-dozen more baritones like Mr. Santley.

661. Do you think that number would find sufficient employment?—Certainly; I have no doubt about it.

662. You heard the evidence of Mr. Costa?—Yes.

663. Do you generally concur with it?—Almost entirely; more particularly as to a uniform style of teaching in every branch of the Academy.

664. You think the comparative failure of the Royal Academy of Music is to be attributed to the want of individual responsibility and individual management?—I do not know enough of it to say that. The want of a uniform school of instruction is undoubtedly a very serious objection. A pupil leaves the institution, not with an Academy polish, but with the method of his master, hence, after more than forty years, there is no such thing as individual Academy style.

665. That would be the fault of management?—I merely speak of the result. There is no uniformity of style.

666. You think a distinct school of music a desideratum?—Yes; decidedly.

667. And you apply that to all the teaching?—Yes; as a ruling principle.

668. In your opinion the musical director of the Academy should be solely responsible and should have the sole control of the musical education; he should give his own style and feeling to the musical education of the Academy?—Yes; the director should have supreme authority, and be held responsible for the proper carrying out of every arrangement connected with the education of the students.

669. With regard to the admission of amateurs into the academy, do you think the teaching of the academy should be limited to those who intend to make music their profession in life?—I do not see that you have any right to draw such a distinction. If a person pays his fees I don't see that you have any right to question him on the subject.

670. Do you think it desirable to limit the education to professors only?—It would be absurd, I think, to attempt to do so.

671. Do you think any jealousy would be created if you gave such teaching in the academy as might interfere with the private tuition of music?—If you put forth a prospectus, stating that upon certain conditions a person may enter the academy as a pupil, I think you have no right to ask to what purpose the education is to be applied. Many men walk the hospitals and attend lectures without any intention of becoming surgeons.

672. Do you not think it desirable to regulate the fees paid by students according to their circumstances in life?—That is a very different matter. With regard to the National College it is stated in the prospectus that, "Although the scale of fees is very moderate, the council have the power of assisting those showing remarkable talent, by granting a lower scale of payment by the establishment of scholarships, and even by gratuitous instruction under peculiar circumstances." It is only right that I should state that nearly every applicant for admission was deemed by friends to meet the privilege of being classed as one "under peculiar circumstances."

673. With regard to the opportunities for composers hearing their own music performed in the way it ought to be; is there not a great want of such opportunities?—Certainly.

674. And would not a theatre attached to the Academy be a great advantage for that as well as other purposes?—Decidedly.

675. And would it not equally apply to *artistes* for the stage?—Quite so. With regard to composers, the moment a musical work is completed the difficulties of a composer commence. A great musical work cannot be produced, particularly if there are choral parts in it, at less than about £200 expense, irrespective of finding the music. A room for hearing the works of composers would be a great boon to that class. A theatre would be most valuable in preparing pupils for the stage. Some of the most distinguished *artistes* of the day have had to learn their business on the stage in the presence of public audiences.

676. Do you concur in the opinion that has been generally expressed before this Committee, that it is better to try and reform the present Academy than to start an entirely new institution in opposition to it?—I have not thought at all on that subject.

677. Do you not think, in the circumstances under which the Royal Academy was founded, there would be almost insuperable difficulty in creating a new establishment in opposition to it?—I think you must first see what may be done by the government before you can judge of the extent to which you may be able to reform the existing Academy. Finance is the great question.

678. Do you not think it possible to amend the Academy so as to make it virtually a new institution?—Then it would be a new institution.

679. You are not opposed to the present title of "Royal Academy"?—Not to the name. I only object to the system which has prevailed.

CANTOR LECTURES.

"ON SUBMARINE TELEGRAPHY." BY FLEEMING JENKIN, Esq., C.E., F.R.S.

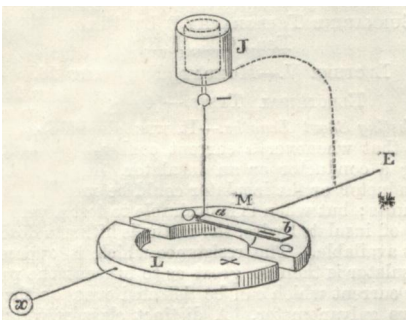
LECTURE V.—MONDAY, FEBRUARY 26.

ELECTRICAL TESTS.—(Continued.)

1. *Testing Short Lengths.*—It was shown in the last lecture that whenever a current could be observed traversing a conductor or an insulator, the resistance of the conductor or the insulator could be measured in definite units; but when it is desirable to test a very short length of insulated wire, the methods hitherto described are not available. The resistance which is opposed by the insulator is then so great as to prevent the passage of any current which can be detected even on the most sensitive galvanometer. A distinct class of tests must then be applied, which, as will presently be shown, give the same information as the tests by the direct observation of currents, and even indirectly give the resistance of the insulator in the same units. All are probably familiar with some of the properties acquired by a body charged with statical electricity by the electrical machine, such as the power of at first attracting light bodies and then repelling them when they are similarly electrified, &c.; few will have attempted to repeat these simple experiments without discovering that there is much difficulty in retaining the charge of electricity, as it is called; no sooner has the pith ball or the brass knob acquired the desired properties than they are lost by leakage along the insulating glass stems or silk threads. The insulation required for these experiments is of exactly the same nature as that required for submarine cables, the leakage down the glass stems is due to conduction, just as the leakage from a submarine cable is due to conduction through the insulator; and the current or quantity of electricity conveyed away is often in both cases too small to be shown by a galvanometer. It is not difficult, however, to observe how long the body charged keeps its peculiar properties, and this time is itself a measure of the goodness of the insulation, or, in other words, of the magnitude of the resistance which the insulator offers to the passage of the current. We may, therefore, charge a short length of cable with statical electricity, and observe the time required to allow that charge to fall to say half its original amount. The gradual fall of the charge may be observed by an electrometer, an instrument specially adapted to show the tension or potential, as it is called, of an electrified body. The rudest of all these instruments is the common gold leaf electroscope, and roughly we might test a short insulated wire by charging it while the conductor is connected to the gold leaves, and the insulator is dipped into an un-insulated basin of water; if the gold leaves at once collapse the insulation is bad; if they remain long divergent the insulation is good. But no two gold-leaf electrometers are alike, nor are they in any way adapted for exact measurement. Peltier's electrometer would give somewhat more accurate indications. The needle repelled by the brass knob would deflect to a given number of degrees, and its gradual return could equally be observed in degrees and fractions. The deviations are not, however, proportional to the potentials producing them, and most Peltier's electrometers are constructed without any expectation that they should be used for accurate measurements. They require, moreover, a very high tension to show any effect whatever. Professor William Thomson has, to obviate these defects, designed various electrometers, of which the divided ring electrometer is, perhaps, the most convenient for testing cables. It is constructed on the following

principle:—A light flat aluminium needle *a b*, Fig. 1, balanced by a counterpoise, is suspended by a platinum wire from a point connected with the interior coating of a Leyden jar. Under the needle two half rings, L and

FIG. 1.



M, are placed, with the division on one side directly under the aluminium needle in its position of rest. The whole is placed inside a metal case, not shown in the drawing. Suppose the needle *a b* not to be charged, then, if L be connected with *x*, an electrified body, while M is connected with the earth, the needle will turn slightly towards L, and this will be the case whether the electricity of *x* be positive or negative. If we now charge the Leyden jar with, say negative electricity the needle will be brought to the same potential as the inner coating; it will be much more strongly attracted than before by L if the electricity of *x* be positive, and would be powerfully repelled if *x* were negative. If *x* loses its electricity and returns to the potential of the earth, the needle *a b* will return to its original indifferent position between L and M, being equally attracted by both. One object of connecting the needle with a Leyden jar is to provide a considerable supply of electricity for the needle, so that the unavoidable slight leakage which must occur may not affect one test or even a series of tests. A loss of one unit of electricity per minute will matter little if the whole store be one thousand, such as may be held by the jar; but if the store be only one or two units, such as would be received by the needle, such a loss would be fatal. The deflections will also be greater and the instrument will be more sensitive the higher the potential to which the jar is charged, but the indication will only be constant so long as the jar is charged to the same degree. In the instrument, as made, the deflections are shown by a spot of light reflected from a mirror hung above the needle as in the reflecting galvanometers. The Leyden jar is placed in an atmosphere dried by sulphuric acid, and will hold a sensibly constant charge for days at a time. Finally, the metal case screens the needle from all attraction or repulsion by bodies electrified outside, owing to a well-known law. The deflections, being angularly very small, are proportional to the potentials of the bodies to be tested, which are connected with L; while M is kept permanently in connection with the earth. With this instrument, nothing is easier than to compare accurately the times occupied by the charged conductor of a piece of cable covered with water in falling from the first tension to half or any other fraction, and the times thus occupied are relative measures of the insulation resistance of the insulating cover. No very high tension is required, and the test by this instrument gives one direct proof of the identity of electricity given by friction and that from the voltaic battery. In making the test the cable may be charged by a spark or two from a machine or electrophorus, or it may be charged by simple contact for an instant with a wire joined to one pole of a voltaic battery of say 50 or 100 elements. It will readily be understood that when we

know how fast a reservoir of given capacity empties itself by a given pipe, we may calculate the resistance which the pipe has opposed to the passage of the water. Such a calculation would, with water, be much more complicated than with electricity; and the following formula gives the means of calculating, in B.A. units, the resistance of the insulator. When the potential *P* at the beginning, and *p* at the end of a time *t*, measured in seconds, are known—

$$(7.) R = \frac{t}{S \log. \epsilon \frac{P}{p}}$$

Or,

$$(8.) R = \frac{0.4343 t}{S \log. \frac{P}{p}}$$

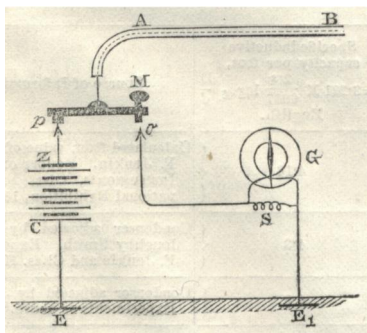
In the first of these equations the hyperbolic, and in the second the ordinary logarithm of $\frac{P}{p}$ is used, but in both we

have a quantity *S*, called the capacity of the cable, the meaning and measurement of which will be presently explained.

Testing Joints.—One use of the test described is to test the joints of insulated wires. When the conductor of a cable is joined in the ordinary way to a battery or otherwise electrified, any leakage which may be observed may be due to the whole or any part of the insulator, and no test of this kind proves a joint separate from the rest of the cable, and the general leakage from a long cable is comparatively so great, that it may entirely mask a very slight flaw at some one point, such as a joint. A joint may be tested by dipping it into an insulated trough connected with one pole of a battery, while the other pole and the cable conductor are joined or connected with the earth. Any current which is then observed must pass through the insulator in the trough, and the test becomes a test of one spot only; but a joint may not be as good as the rest of a cable, and yet have so high a resistance as to show no current in this way. A more searching test is given by the use of the electrometer. Dip the joint in the insulated trough as before, and connect the trough with the test plate L. (Fig. 1.); electrify the trough by a machine or electrophorus, and watch the gradual loss by leakage into the cable at that point. The conductor should be connected with the centre. It is of course essential that the trough itself should be very perfectly insulated during this experiment; and a similar remark applies to all tests of short lengths of insulated wire. In unpractised hands the loss by moisture on the surface of supports, dirty keys, and other connections, will generally be much greater than the loss which it is desired to measure. Conduction along the surface of ebonite, used for the instruments, and along the surface of the gutta-percha or other insulator under test, can be partly prevented by extreme cleanliness; but an artificially dried atmosphere is necessary in all cases where extremely high insulation is required; as, for instance, for the Leyden jar of Professor Thomson's electrometer or the trough to test joints. The ends of a short wire to be tested should also be freshly cut. Ebonite, after being in use for instruments for some time, often requires to be freshly polished. As an example of what can be done by selecting proper materials, and by drying the atmosphere, so as to prevent a moist film from being deposited on the surface, the lecturer can, from his own experience, state that Leyden jars, in Professor Thomson's electrometers, can be made to hold their charge so well that not one half per cent. will escape in 24 hours. Such a cable as the Atlantic falls from charge to half charge in about fifteen minutes. Some wires, covered by Hooper's material, fall from charge to half charge in from seven hours to two days.

3. *Induction Tests.*—Hitherto the word charge has been used as having a sense with which all are familiar, and the indications of an electrometer which really measures tension or difference of potential from the earth, have been received as evidence of a greater or smaller charge; it is time to justify these expressions. The charge of electricity which an insulated body will receive really means a definite quantity of electricity. This quantity, when escaping to the earth, which is assumed to be at zero tension, produces a current equal to the quantity divided by the time occupied in its escape. Bodies are said to contain equal charges, when these charges will produce in their discharge equal currents. A charge held by a body is said to be at a certain tension or potential, meaning the quality measured by the electrometer above described. The total charge which a given body in given circumstances will receive is proportional to the potential or tension to which it is raised. Thus, the charge produced by contact with the pole of a battery of fifty cells is fifty times that produced by a single cell. The tension or potential produced by a frictional machine is of exactly the same nature as that produced by the voltaic battery; it is simply greater in amount. Thus a body may be charged equally by sparks from an electrophorus, and by a voltaic battery; then if this charge be allowed to escape through a galvanometer, the current in each case will be equal, and produce an equal deflection; and, again, if two bodies are charged to the same potential, say by contact with one pole of the same battery, then if the current produced by the discharge from the two be equal, the charges on both were equal, and the capacity of both bodies was equal. The capacity of a body for receiving a charge depends on many elements; it increases as the external surface of the body increases, and it increases as the surrounding bodies in connection with the earth are brought near to the insulated electrified body. Thus the capacity of a Leyden jar, where the inner electrified surface is large, and close to the outer unelectrified surface, is much greater than that of a sphere of equal surface in a large room. The general laws regulating capacity and potential are too complex to be here explained; the capacity of a cable increases directly as its length, just as the capacity of two equal Leyden jars is double that of one. The gutta-percha acts the part of the glass; the copper that of the inner tinfoil; the water or moisture outside represents the outer uninsulated coating. Owing to the large surface and slight thickness of the insulation, the capacity of a long cable is very great, and its discharge can be shown on almost any galvanometer; the discharge from a yard can be seen on a sensitive instrument if charged by, say 100 Daniell's cells. Fig. 2 shows the connections required to show the

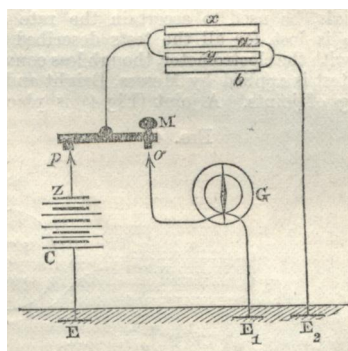
FIG. 2.



discharge. M is a common key, by which the conductor of the cable A B can be first placed in connection with the battery Z C by a contact at *p*, and then removed from the battery, and immediately connected at *o* with one terminal of a galvanometer, G, the other terminal

of which is in connection with earth at E. The contact at *p* charges the cable, and that at O discharges it through the galvanometer. It will readily be seen that as the quantity which goes into the cable must be equal to that which leaves it, if the galvanometer G were placed between Z and *p*, it would be affected to the same extent by the entrance of the charge as by its exit at *o*. With a well insulated cable, deflections due to the rush in or out of the charge are far greater than that due to leakage across the sheath, and it is to avoid the disturbance due to this momentary current that in making insulation tests, no sensible part of the current is at first allowed to run through the galvanometer, but is conducted through a short circuit as at *o*, Fig. 2, lecture IV. The deflection due to the charge or discharge of a short cable is the result of a single very short impulse, and this deflection may be used to measure the charge in two ways. First we may make a standard knot of cable or Leyden jar, or condenser, as it is sometimes called; we may take the discharge from that, as in Fig. 3, where *a b* represent plates

FIG. 3.



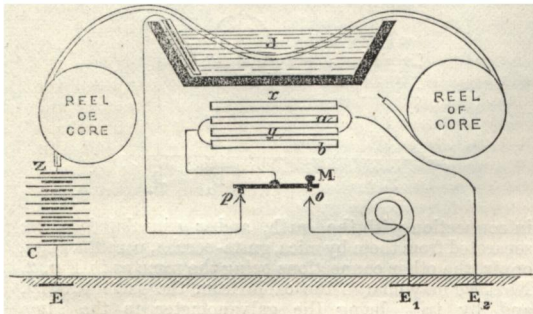
in connection with the earth, and *x y* insulated plates separated from them by mica, gutta-percha, paraffin, glass, or air, the other connections being the same as in Fig. 2. Next we may charge the cable from the same battery, and by trial bring the galvanometer to the same deflection by shunting part of the current through coils, which can be adjusted; if $\frac{1}{100}$ th part of the current pass through G, then the capacity of the cable is one hundred times that of the condenser; the relative charges, if not differing much, may be taken as proportional to the deflections on a reflecting galvanometer, or, more strictly, to the sines of half the angles on any instrument. A galvanometer with a comparatively heavy needle is better for this purpose than a reflecting instrument with mirror and light magnets, owing to the resistance of the air. The comparison of capacities may be made in a much more accurate manner by various less well-known devices; as, by the transfer of a charge from one condenser to another, and the measurement of the potential before and after the transfer; by the relative effect of two discharges in opposite directions through a differential galvanometer; by balancing a succession of discharges through one coil of a differential galvanometer against a permanent current adjusted with the aid of resistance coils; and by balancing the discharges against a permanent current in an arrangement resembling a Wheatstone balance. These arrangements have, it is believed, not yet been used as practical tests, but it will be useful to give here a formula by which we may compare the results of any two or more observers, who have not got galvanometers which they have compared, or condensers of known relative capacities. Let S be the capacity of a conductor measured in the units required for equation 8; let *t* = half the time of a complete oscillation of the needle of the galvanometer under the influence of terrestrial magnetism

alone, i = the angle to which the needle is thrown by the momentary current, R_1 = the resistance in B A units of the circuit through which the battery used to charge the cable would produce the unit deflection on the galvanometer, then

(9.)
$$S = 2 \frac{t \sin \frac{1}{2} i}{\pi R_1}$$

The accuracy with which this measurement can be made is not very great, owing to the difficulty of measuring t on most instruments. The charge is said to be due to induction, and these tests are called induction tests; it now remains to show their practical application. The discharge may be used to measure insulation, thus: charge the cable by contact at p (Fig. 2.), and then break contact at p without making contact at o ; the charge which is as it were bottled up inside the cable, leaks gradually through the gutta-percha. After, say one minute, make contact at o , and observe the difference between the deflection thus obtained and that obtained when the cable is discharged immediately after being charged. The difference measures the loss in one minute. The galvanometer can in this way, by successive trials, be used to ascertain the rate at which the charge is lost, for all the tests described above as measured with the electrometer, though less conveniently. A similar test is applied by Messrs. Bright and Clark to the testing of joints. A joint (Fig 4) is placed in an

FIG. 4.



insulated trough of water connected with a condenser, the battery is applied to one end of the cable, and any slight leakage which may occur at the joint gradually accumulates in the condenser. After a minute or more

the condenser is discharged through a galvanometer, which may then show the result of a minute's accumulation even when the permanent current passing at any moment would not have been sensible. But these are only the indirect consequences of the induction test. Its main object is to compare the capacities of various cables, and the inductive properties of various materials; and the reason why these points are important is, that the number of words which can be transmitted per minute through long submarine cables is, *ceteris paribus*, inversely proportional to their capacity. So that a long cable A, each knot of which will, from a given battery, receive only half the charge received by cable B (equal to A in other respects), will transmit double the number of words per minute. The cause of this cannot here be explained, but the fact is experimentally and theoretically proved. By theory, the charge on equal lengths of two wires, covered with the same insulator,

should be inversely proportional to $\log \frac{D}{d}$ when D and d as before indicate the diameter of the insulator and conductor; but the capacity also varies with the insulator used, thus the charge on a knot of the Persian Gulf cable, insulated with gutta-percha, was 35 per cent. greater than a knot of similar dimensions insulated by Hooper's material, and was somewhat more than four times greater than the charge would have been had it been possible to find an insulator with the properties of air instead of gutta percha. The property of a material in virtue of which it affects the charge is called its inductive capacity, and the ratio of the charge induced when the solid material is used, to that which would be induced if air were the insulator, is called the specific inductive capacity of the material. It will be seen that equation 9 gives the means of expressing the capacity of a knot of cable in certain units. Table XIII. gives the calculated capacity of some cables and materials in these units, with the specific inductive capacity of gutta percha, india rubber, and Hooper's material. These numbers are very much less well ascertained than the resistance measurements given in previous tables. Nevertheless improvement in this quality is of very much greater importance than improvement in insulation resistance. Neither temperature nor pressure seems to affect the charge or capacity of cables very materially.

4. *Tests to Detect Faults.*—Faults in cables may be classed as follows:—1. A fracture or interruption in the copper conductor, which, nevertheless, remains insulated inside the gutta-percha covering. 2. A fracture of the

TABLE XIII.—INDUCTION TESTS.

Name of Cable.	Material.	S = Electro-magnetic capacity per knot, multiplied by 10 ¹²	s = Electrostatic capacity per knot, in absolute measure. French.	Specific inductive capacity per foot, $\left[= 3 \cdot 281 \times \frac{2s}{6087} \log \cdot e \frac{D}{d} \right]$ English.	Source of Information.
Malta-Alexandria	Gutta-perche	0.0399	3583	4.18	{ Calculated from value of I, given by F. Jenkin. Report on Electrical Instruments, Class XIII., International Exhibition, 1862.
Atlantic cable	Gutta-percha	0.0345	3340	4.3	
Persian Gulf cable	Gutta-percha	0.0323	3120	4.2	{ Condenser adjusted by Mr. W. L. Smith. Experiments by F. Jenkin and Chas. Hockin.
Hooper's cable, Persian Gulf pattern	Partly vulcanized India-rubber	0.0239	2310	3.11	
	Masticated India-rubber			2.82	{ Compared by Prof. W. Thomson, and independently by Messrs. Bright and Clark, with Persian Gulf gutta-percha cable.
					{ Jurors' Report, International Exhibition, as above.

copper conductor and gutta-percha, in which a considerable length of copper wire remains exposed to the water. 3. A fault intermediate between the first two, with copper and gutta-percha both broken, but little copper exposed. 4. A connection between the iron covering and the copper by a nail or wire driven in. 5. A hole or imperfection in the gutta-percha sheath, establishing a connection of considerable resistance between the conductor and the sea. The first of these faults is of course followed by a total cessation of all electrical communication between the two ends of the cable. Its position may be detected in two ways. The charge which the cable will contain may be measured as above described, and if the charge per knot is known, the charge observed will directly give the distance of the break, and the accuracy with which the position of the fault can be determined is limited only by the accuracy with which the relative charges can be compared; the cable is an insulated Leyden jar, the capacity of which is simply proportional to the length of the conductor from the shore to the fault. So that if the discharge from a knot of the cable, with a given battery and reflecting galvanometer, is represented by a deflection of ten divisions, and the discharge from a cable containing a broken copper conductor is 100 divisions, we may feel certain that the fault is about ten miles from shore. By the more accurate modes of comparing discharges, the distance of a fault of this kind, even on a long cable, might be accurately found. The method by the throw or deflection of a needle is not applicable to a very long cable, because of the time occupied by the discharge; the theory of the formula given above, supposes that the needle moves under a sudden impulse, very short compared with the time of oscillation of the needle. A second plan of determining the position of this kind of fault is to measure the resistance of the insulating sheath. Thus, if we know by the discharge-test that the cable is insulated where broken, and find the insulation resistance to be 1,000 units, whereas the insulation resistance of one knot is 1,000,000 units, we may conclude that the fault is 1,000 miles off, as it will require one thousand miles of sound core to give so small a resistance as 1,000 units. Faults of this kind are very rare where strands of copper properly jointed are used. The second kind of fault enumerated also wholly stops communication between the two ends of the cable, and almost invariably occurs when a cable is broken with violence. The copper and gutta-percha are then both stretched, and the gutta-percha springs back when the copper breaks, and leaves the latter exposed; but sometimes the copper breaks some little way from where the gutta-percha yields and inside it; then the third kind of fault occurs intermediate between the two former. When some inches of copper are exposed, a connection of small resistance is formed with the sea. In this case the resistance of the copper conductor, measured from the shore, measures the distance of the fault; we know the resistance per knot, and if we observe 500 times this resistance the fault is 500 miles off, the resistance of the earth itself being nil. A small correction ought of course to be made for conduction through the insulator when sound, but in good cables this may be neglected. It is by this test that the operators at Valencia are able to tell that they have still the full length of cable between them and the spot where the cable was first broken. There is little difficulty in determining whether a fault of this nature has occurred, for the comparatively small resistance of the cable shows that it is connected with the sea where it ought not to be, and the constancy of that resistance shows the connection to be complete. This brings us to the third class of fault, where the connection between the sea and copper exists, but is imperfect, or due to only a small area of exposed copper. The fault itself, then, possesses considerable resistance, sometimes more than that of all the copper conductor of the cable, and, what is worse, this resistance is inconstant, varying rapidly and capriciously

between extremely wide limits. The test for resistance in that case simply tells us that the fault cannot be beyond the distance corresponding to the smallest resistance observed. The fourth kind of fault corresponds almost exactly in behaviour to the second, but the connection with the sea is still more perfect; the resistance will vary still less, and there will be a total absence of the feeble currents which result from the copper and iron of a cable when broken and separated by salt water. Earth currents, due to a difference of potential between the shore and sea, at the fault, may of course, in both cases, be observed. The fifth kind of fault is easily detected; there is a considerable fall in the insulation resistance, and a slight or moderate fall in the apparent resistance of the copper conductor between the two stations, but messages can still be transmitted, as a portion only of the whole current, inversely proportional to the resistance of the fault, escapes into the sea. If one station insulates the cable, and the other measures the resistance, the fault behaves like a fault of the third class, and this test will not detect its position. If, however, the resistance of the fault remain constant, and two measurements of resistance, R and r , be made from station A , when station B respectively insulates the end of the cable and connects it with the earth, we obtain two equations concerning the resistances, in which there is only one unknown quantity, viz., the resistance of the fault. When this is eliminated, the following equation is obtained:—

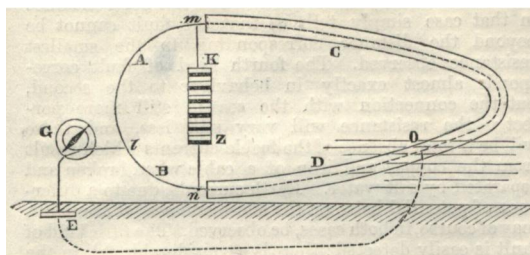
$$(10.) \quad D = r - \sqrt{(R - r)(L - r)}$$

where D = the resistance of the conductor between the fault and the observer, and L = the resistance of the whole conductor between the stations. On very long cables a correction for the effect of the uniform leakage through the insulator would be necessary, but this correction fades into insignificance in comparison with the error introduced by the supposition that the resistance of the fault will remain constant during the two tests. Successive tests from the two stations, the distant end being insulated in each case, will also give two equations, by which, on the same supposition, that the resistance of the fault remains constant, its position can be determined. Then calling R and R_1 the resistance in the two cases, we have—

$$(11.) \quad D = \frac{L + (R - R_1)}{2}$$

when D is the resistance of the conductor between the station which observed the resistance R and the fault. This test labours under the same defect as the previous one. When a return insulated wire can be substituted for the earth, so that the observer has both ends of a complete metallic circuit before him, the position of a fault, such as is described, even of varying resistance, can be accurately determined by more than one method. Mr. Varley uses a differential galvanometer, a well known instrument, to ascertain when an equal current runs into both ends of the metallic circuit, and out at the fault. This will only be the case when the resistance between the galvanometer and the fault is the same by both roads; this condition is easily fulfilled by adding resistance coils between one coil of the galvanometer and the defective wire. The resistance which must thus be added to bring the galvanometer to zero is obviously equal to twice the resistance of the metallic conductor between the fault and the distant station. Prof. Wheatstone's balance may be so arranged as to give another method, by making the connections as in Fig. 5, where the fault, supposed to be at a , forms, as it were, part of the galvanometer wire. In this case, as in the preceding, a variation in the resistance of the fault does not affect the result; it will cause a greater or less deflection in the galvanometer until the desired balance is effected; but it will not alter the relative resistances of the several parts of the main circuit required to reduce the deflection to zero. The test in Fig. 5 is

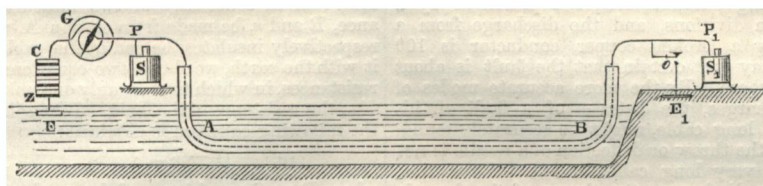
FIG. 5.



made by adjusting the relative resistances of A and B; until no deflection is obtained; then the fault will be at a point such that $\frac{A}{B} = \frac{C}{D}$ where C and D represent the resistance of the conductor separating *m* from the fault and *n* from the fault. When the total resistance of

the conductor is known, this will give the position of the fault very accurately. Mr. John Murray, of Glasgow, is said by Professor Thomson to have first applied this test on board the *Niagara* during the first Atlantic expedition. It was re-invented by the lecturer, and may be used to detect very small faults even on short lengths. It is now only necessary to describe one more plan of determining the position of a fault of this nature by a simultaneous test at both stations, or on board ship and on shore. This plan is Professor Thomson's, but it was also re-invented by the lecturer after seeing Mr. Smith's test, described in lecture IV. This re-invention is not very remarkable, as the lecturer owes the chief part of his theoretical instruction in electrical science to Professor Thomson, and is familiar with his instruments and methods, but as this is, he believes, the first publication of the plan, he thinks it well to state these circumstances. The connections required are shown in Fig. 6, where G is a galvanometer; S, an electrometer at the same station; S₁ an electrometer at a

FIG. 6.



distant station, where the end of the submerged cable AB is insulated. The battery CZ is connected with the other end of the cable. Then let C = the current observed on the galvanometer, V the potential at the same station, U the potential at the distant station, *l* = the length of the cable, K the resistance of the unit lengths of the conductor, *n* the resistance of the unit length of insulator to conduction across the sheath, and let $\sqrt{\frac{K}{n}} = a$. All these quantities may be known, and should be measured in the so-called absolute units, or other equally coherent system. Let λ be the distance of the fault from the ship, or galvanometer station, then:—

$$(12). \quad \lambda = \frac{1}{2a} \log_{\epsilon} \frac{F}{D}$$

When

$$F = V + \frac{K}{a} C - U \epsilon^{al}$$

And

$$D = U \epsilon^{-al} + \frac{K}{a} C - V$$

Undoubtedly this test is not of so simple a nature, that it could be executed by an ordinary clerk, but it is interesting to know that a test does exist by which even a fault of this description, which has hitherto baffled electricians, can have its position fixed with mathematical certainty. This is the more important as the connections shown in Fig. 6 are precisely those which are in the lecturer's opinion, the best adapted for tests during the submersion of a cable. The marine galvanometer G would give one test of insulation, the electrometer S a second one, the electrometer S₁ a third test on shore. The shore would speak to the ship without causing a suspension of the insulation test either on S or G, and even when the ship speaks to the shore the electrometer S will maintain the insulation test, as it is not affected like the galvanometer by the rush of the current in and out of the cable as it is partly discharged or additionally charged by the withdrawal or addition of part of the battery power. The electrometers have, on the same grounds, a superiority

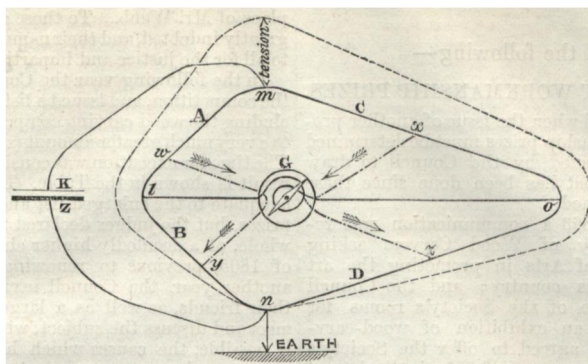
over the galvanometers in their behaviour, under the influence of earth currents or the rolling of the ship. But in favour of Mr. Willoughby Smith's plan, it must be conceded that more operators can at present be found who are familiar with galvanometers than with electrometers; so that clerical errors would not be so likely to occur with his plan as with that just described. The lecturer concluded by saying that he might have shown many pretty experiments with powerful magnets, long sparks, coloured tubes, &c., but he had been anxious to show experiments by which real work was done rather than the more amusing or striking features of electrical science; and he begged to thank the audience for the kindness with which they had listened to his endeavours.

APPENDIX III.

EXPLANATION OF WHEATSTONE'S BALANCE.

Fig. 7 shows the connection of this arrangement, in which the letters are similarly arranged, and have the same meaning as in Fig. 1, Lecture IV.; but a dotted line has been added surrounding the four conductors A B C and D, and these have been joined to earth at *n*. Let us suppose the galvanometer wires to be removed from *l* and *n*; the ball K of the battery will produce a maximum tension at *m*, and this tension will gradually decrease round both conductors A B and C D, to nothing at *n*, as would be shown by an electrometer such as is above described. Moreover, this tension decreases precisely in proportion to the decrease of resistance between any given point and earth; so that if the wires A B C D were straightened out as in Fig. 8, and the resistance represented by their length, the fall of tension along each wire would be exactly represented by the height of the dotted straight line shown above each conductor, the maximum height being supposed to correspond to the full tension of the battery. The current in the two wires would of course be very different, but half way along each the tension would be equal to half the maximum; at two-thirds of the distance it would be in each wire be two-thirds of the maximum, and so on. Now if two points of the conductors, at equal potentials or tensions, are joined by a wire, no current will pass along that wire, for a current

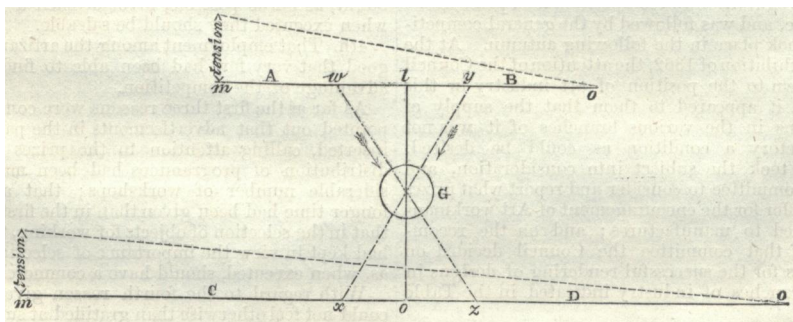
FIG. 7.



is always due to a difference of tension acting like a head of water; the case is analogous to that of a pipe joining two reservoirs; if the water in each be at the same level no current will flow through the pipe, no matter how deep the reservoirs may be, so that if the galvanometer

wires are applied to two points so chosen that $\frac{A}{B} = \frac{C}{D}$, the tensions at those points being equal, no current will pass through the galvanometer. But if the wires

FIG. 8.



are applied as at y and z , a current will pass through in the direction of the arrow, and if the wires are applied, as at z and w , a current in an opposite direction will pass, so that by trial we may always ascertain the exact points at which the condition $\frac{A}{B} = \frac{C}{D}$ is fulfilled. The dotted line round ABCD in Fig. 7 corresponds to the dotted line in Fig. 8, and represents the gradual fall of tensions. When the galvanometer wires are applied, as at y and z and w , this dotted line should be slightly modified, but the modification will not affect the truth of the above reasoning.

The CHAIRMAN (Mr. Wm. Hawes) said he could not allow this course of lectures to close without asking the audience to thank Mr. Jenkin for the singularly able and lucid manner in which he had treated a subject of great difficulty. It was evident not only that the lecturer was thoroughly master of all the intricacies of the science of electric telegraphy, but also that he had devoted the greatest care to prepare such a course of lectures as should convey to his hearers as much knowledge as possible in the few evenings placed at his disposal. He (the chairman) had, in former years, been a pupil of Faraday, and he could not but say that he had never been so strongly reminded of that unequalled lecturer as by the clear and simple addresses of Mr. Jenkin. This was the more remarkable, as he believed this was the first occasion on which that gentleman had lectured to a general audience. He would conclude by conveying, on his own part and that of the Council—and he felt sure he might add, on that of the audience there assembled—their hearty thanks to Mr. Jenkin for his lectures.

THIRTEENTH ORDINARY MEETING.

Wednesday, February 28th, 1866; William Hawes, Esq., F.G.S., Chairman of Council, in the chair.

The following candidates were proposed for election as members of the Society:—

- Abbott, Joseph William, 163, New Bond-street, W.
- Brown, Allan McLaren, 269, Camden-road North, N., and Marlee, Blairgowrie, Perthshire.
- Condy, Henry Bollman, Devonshire House, Battersea, S.W.
- Lomax, J. J., Proprietary School, Hereford.
- Stepney, Cowell, 9, Bolton-street, W.
- Tabraham, Robert, Bellevue House, London-road, Worcester.
- Walker, Robert, 10a, King's Arms-yard, Moorgate-street, E.C.
- White, Henry Nathaniel, 83, Albion-road, Dalston, N.E.

The following candidates were balloted for, and duly elected members of the Society:—

- Brock, James, 21, George-street, Portman-square, W.
- Fretwell, John, 24, Mark-lane, E.C.; and 8, Upper Homerton, N.E.
- Howard, Raymond, 29, King-square, Goswell-street, E.C.
- Patry, James, 7, Cambridge-terrace, Regent's-park, N.W.
- Rutson, John, Newby Wiske, Thirsk, Yorkshire.
- Salt, Titus, Jun., Saltaire, near Leeds.
- Shoolbred, Frederick, 51a, Portland-place, W.
- Turner, Cornelius, St. James's-road, Old Kent-road, S.E.

Wickham, William, 33, Tavistock-street, Covent-garden, W.C.

The Secretary read the following—

REPORT ON THE ART WORKMANSHIP PRIZES.

As the time has arrived when the issue of another programme for Art Workmanship prizes must be determined upon, I have been instructed by the Council to draw up a short report on what has been done since these prizes have been established.

Early in the year 1863 a communication was received from the Society of Wood Carvers asking the aid of the Society of Arts in promoting the art of wood-carving in this country; and the Council agreed to allow the use of the Society's rooms for the purpose of holding an exhibition of wood-carving. The Council also agreed to offer the Society's Silver medal, and to make a grant of £30, the Society of Wood Carvers giving £15, to form a fund for prizes to be awarded on that occasion. Employers or private owners were allowed to exhibit, but *bona-fide* workmen only were eligible for prizes. The terms and conditions of the competition were laid down by the Society of Arts and the Wood Carvers jointly, under three divisions, as given in the column headed 1863, in the Table annexed to this report.* This exhibition and competition took place in the month of June, and was followed by the general competition, which took place in the following autumn. At the close of the Exhibition of 1862, the attention of the Council had been drawn to the position of art industry in this country, and it appeared to them that the supply of skilled artisans in the various branches of it was not in so satisfactory a condition as could be desired. The Council took the subject into consideration, and appointed a committee to consider and report what prizes they should offer for the encouragement of Art workmanship as applied to manufactures; and on the recommendation of that committee the Council decided on offering prizes for the successful rendering of designs in the several branches of industry indicated in the Table headed 1863.

One principle, namely, that of rewarding the actual workman for the work of his own hands, as was the case in the wood-carving competition, was adopted in the offer of these prizes, but instead of leaving the workman free to take any design he might think fit, it was thought well to place before him prescribed examples, of acknowledged merit, from which he was to work, it being considered advantageous that the workman should have his attention particularly directed to the works of artists of high reputation which might aid in educating his taste. Accordingly the Council in each case named the subject to be worked, and sold to the workmen at cost price, photographs, chromolithographs, casts in plaster, as well as rough casts in bronze, of the examples prescribed. The time allowed for the works being sent in was necessarily short, but, nevertheless, bearing this in mind, and looking at the difficulty of making known the competition among those interested, the result, as will be seen by reference to the Table (1863), was very encouraging. The judges for the wood-carving were appointed—three by the Council and three by the Wood-Carvers Association—the prizes in this department being offered jointly by the two bodies; and Messrs R. Redgrave, R.A., Mr. Digby Wyatt, and Mr. John Webb undertook the duty on the part of the Council. These gentlemen all acted as judges in the general competition of the same year, and also in that of the following year (1864). In the last year (1865), owing to the unfortunate illness of Mr. John Webb, he was unable to act, and Mr. Alfred Morrison, at the request of

the Council, gave his services as one of the judges in the place of Mr. Webb. To these gentlemen the Society are greatly indebted, and their names are a sufficient guarantee to all for the justice and impartiality of the awards.

In the following year the Council determined to renew the competition, and issued a list, very much extended, including the wood carving competition, and offering prizes to a very much greater amount (see the Table headed 1864). The time for execution was considerably enlarged, and the result is shown in the Table. The response has not been adequate to the enlarged list and the increased amount of prizes, but the judges declared that the work was, on the whole, of a decidedly higher character. In the January of 1865, previous to renewing the offer of prizes for another year, the Council invited the competitors and their friends, as well as a large number of delegates, to meet and discuss the subject, with a view of ascertaining, if possible, the causes which had led to so small a response to the programme. At this meeting the reasons put forth were—

1st. That the competition had not been sufficiently made known in the quarters interested in the subject.

2nd. That sufficient time had not been given for the execution of the work.

3rd. That sufficient care had not been taken in the selection of the articles required to be worked, which ought, as far as possible, to be of such a character that when executed they should be saleable.

4th. That employment among the artisans had been so good that very few had been able to find time to take advantage of the competition.

As far as the first three reasons were concerned, it was pointed out that advertisements in the papers had been inserted, calling attention to the prizes offered, and a distribution of programmes had been made in a considerable number of workshops; that a very much longer time had been given than in the first competition; that in the selection of objects for working, the Committee had kept in view the importance of selecting such works as, when executed, should have a commercial character.

With regard to the fourth reason given, the Council could not feel otherwise than gratified at such a condition of business. The Council, in issuing their next programme, took into their consideration the first three objections which had been raised. In going over the programme it was thought desirable to extend it, and in every case where it was possible examples were selected with a view to the works, when executed, being of a saleable character, and a longer time was given for the execution. The particulars of this competition are given in the Table headed 1865.

Increased means of publicity was taken, by advertisements in the newspapers, not only of the metropolis and in such of them as are known to have a circulation among working men, but also in the newspapers of Birmingham, Sheffield, the Potteries, and other centres of industry. The programmes were distributed widely in quarters where it was thought likely they would attract attention; and a large number were placed in the hands of the Wood Carvers Association, for distribution among their members.

An appeal was made by the Council to the various City Companies for help in the way of prizes; but two only answered the appeal—the Worshipful Company of Salters and the Worshipful Company of Plasterers—the first giving an annual donation to the general prize fund of £10, and the latter giving two special prizes, to the amount of £15, in that branch of trade with which they are connected, to be competed for by artisan apprentices and students.

The time given for the execution of the works amounted to very nearly twelve months, and the result, as appears by the Table (1865), does not show an adequate response. The question arises what are the causes which have led to this state of things, and can any steps be taken by which a larger number of competitors can be secured?

* This will be found at the end of the Table; it is there placed for convenience of comparison with the subsequent years, though in fact this competition preceded in time, and was separate from, the general competition, the particulars of which are found in the first portion of the Table.

1863.	Works sent in.	Prizes awarded.
1st DIVISION.		
WORKS TO BE EXECUTED FROM PRESCRIBED DESIGNS.		
CLASS 1.—MODELLING IN TERRA COTTA, PLASTER, OR WAX.		
(a.) The Human Figure in bas-relief	23	1st and 2nd
(b.) Ornament in bas-relief	8	1st and 2nd
CLASS 2.—REPOUSSE WORK IN ANY METAL.		
(a.) The Human Figure as a bas-relief	3	2nd
(b.) Ornament	1	1st and 2nd
CLASS 3.—HAMMERED WORK, IN IRON, BRASS, OR COPPER.		
Ornament	2	Two 2nd prizes
CLASS 4.—CARVING IN IVORY.		
The Human Figure in bas-relief	4	1st and 2nd
CLASS 5.—CHASING IN METAL.		
(a.) The Human Figure	6	1st and 2nd
(b.) Ornament	11	Two 1st and two 2nd
CLASS 6.—ENAMEL PAINTING ON METAL, COPPER, OR GOLD.		
(a.) The Human Figure	none	{ Not in accordance with con- ditions.
(b.) Ornament in grisaille	1	
CLASS 7.—PAINTING ON PORCELAIN.		
(a.) The Human Figure	5	1st and 2nd
(b.) Ornament	3	2nd
CLASS 8.—INLAYS IN WOOD (MARQUETRY, OR BUHL), IVORY OR METAL.		
(b.) Ornament	2	Two 2nd
CLASS 9.—ENGRAVING ON GLASS.		
(b.) Ornament	none	..
CLASS 10.—EMBROIDERY.		
Ornament	1	None
2ND DIVISION.		
WORKS TO BE EXECUTED WITHOUT PRESCRIBED DESIGNS.		
(a.) Human figure in alto or bas-relief	76	{ 2nd and 3rd 1st, 2nd, and 3rd 1st, 2nd, 3rd, and two extra.
(b.) Animal or still life		
(c.) Natural foliage, fruit, or flowers, or conventional ornament		

Prizes to the amount of £162 were offered.
Seventy works were sent in,
Amount awarded, £109.

1864.	Works sent in.	Prizes awarded.
1ST DIVISION.		
WORKS TO BE EXECUTED FROM PRESCRIBED DESIGNS.		
CLASS 1.—CARVING IN MARBLE, STONE, OR WOOD.		
(a.) The Human Figure	5	1st and 2nd
(b.) Ornament	1	2nd
(c.) Ornament	3	1st and 2nd
(d.) Carving in wood—A design by Holbein	1	2nd
(e.) Wood carving.—Head of a harp	1	2nd
(f.) Ornament .. .. .	..	..
CLASS 2.—REPOUSSE WORK IN ANY METAL.		
(a.) The human figure as a bas-relief	4	2nd
(b.) Ornament	3	1st and 2nd
CLASS 3.—HAMMERED WORK, IN IRON, BRASS, OR COPPER.		
Ornament	3	1st and 2nd, and one extra
CLASS 4.—CARVING IN IVORY.		
(a.) Human figure in the round	2	Two 2nd
(b.) Ornament .. .. .	..	..
CLASS 5.—CHASING IN BRONZE.		
(a.) The human figure	1	1st
(b.) Ornament	9	1st and 2nd
CLASS 6.—ETCHING AND ENGRAVING ON METAL,—NIELLO WORK.		
Ornament	2	1st

1864.—(Continued.)					Works sent in.	Prizes awarded.
CLASS 7.—ENAMEL PAINTING ON COPPER OR GOLD.						
(a.)	The human figure..	..	..	..	none	
(b.)	Ornament ..	..	..	..	none	
CLASS 8.—PAINTING ON PORCELAIN.						
(a.)	The human figure..	..	..	..	7	None
(b.)	Ornament ..	..	..	..	2	1st
CLASS 9.—DECORATIVE PAINTING.						
(a.)	Ornament ..	..	..	..	2	2nd
(b.)	Ornament ..	..	..	..
CLASS 10.—INLAYS IN WOOD (MARQUETRY, OR BUHL), IVORY OR METAL.						
	Ornament ..	..	..	..	1	1st
CLASS 11.—CAMEO CUTTING.						
(a.)	Human head ..	..	..	..	2	2nd
(b.)	Animal ..	..	..	..	1	None
CLASS 12.—ENGRAVING ON GLASS.						
	Ornament ..	..	..	..	none	
CLASS 13.—WALL MOSAICS.						
	Human head ..	..	..	..	4*	{ 1st and 2nd 1st †
CLASS 14.—GEM ENGRAVING.						
(a.)	Human head ..	..	..	..	3	None
(b.)	Full-length figure..	..	..	..	1	2nd
CLASS 15.—DIE SINKING.						
	Human head ..	..	..	..	5	2nd
CLASS 16.—GLASS BLOWING						
	Ornament ..	..	..	..	none	
CLASS 17.—BOOKBINDING AND LEATHER WORK.						
(a.)	Bookbinding ..	..	..	..	1	1st
(b.)	Leatherwork ..	..	..	..	none	
CLASS 18.—EMBROIDERY.						
	Ornament ..	..	..	..	none	
2ND DIVISION.						
WORKS TO BE EXECUTED WITHOUT PRESCRIBED DESIGNS.						
WOOD CARVING.						
(a.)	Human figure in alto or bas-relief. Animals or natural foliage may be used as accessories ..				19	2nd and 3rd, and two extra
(b.)	Animal or still life. Fruit, flowers, or natural foliage may be used as accessories..				5	2nd
(c.)	Natural foliage, fruit, or flowers, or conventional ornament in which grotesque figures or animals may form accessories, preference being given where the work is of an applied character for ordinary decorative purposes as representing commercial value ..				9	Two 3rd, and one extra

Prizes to the amount of £623 were offered,

Ninety-six works were sent in,

Amount awarded, £274.

* Three general competitors. One Female competitor.

† Female competitor.

1865.					Works sent in	Prizes awarded.
FIRST DIVISION.						
WORKS TO BE EXECUTED FROM PRESCRIBED DESIGNS.						
CLASS 1.—CARVING IN MARBLE, STONE, OR WOOD.						
(a.)	The Human Figure ..	..	..	..	3	Two 2nd
(b.)	Ornament ..	..	..	..	2	2nd and extra
(c.)	Ornament ..	..	..	..	1	None
(d.)	Carving in wood after a design by Holbein ..	..	..	..	none	
(e.)	Carving in wood after the Head of a Harp ..	..	..	..	none	
(f.)	Ornament ..	..	..	..	none	
(g.)	Ornament carved and gilt ..	..	..	..	none	
CLASS 2.—REPOUSSE WORK IN ANY METAL.						
(a.)	The Human Figure as a bas-relief ..	..	..	..	5	None
(b.)	Ornament ..	..	..	..	1	1st, and 3rd added
CLASS 3.—HAMMERED WORK, IN IRON, BRASS, OR COPPER.						
	Ornament ..	..	..	..	3	1st and 2nd

1865.—(Continued.)					Works sent in.	Prizes awarded.
CLASS 4.—CARVING IN IVORY.						
(a.)	Human Figure in the round ..	..	..	..	2	{ Neither 1st nor 2nd — a smaller one given.
(b.)	Ornament .. ..	..	..	..	none	
CLASS 5.—CHASING IN BRONZE.						
(a.)	The Human Figure .. ..	..	..	..	none	Two 2nd and one extra
(b.)	Ornament .. ..	..	..	..	4	
CLASS 6.—ETCHING AND ENGRAVING ON METAL—NIELLO WORK.						
	Ornament .. ..	..	..	..	1	2nd
CLASS 7.—ENAMEL PAINTING ON COPPER OR GOLD.						
(a.)	The Human Figure .. ..	..	..	..	2	2nd
(b.)	Ornament .. ..	..	..	..	1	1st
CLASS 8.—PAINTING ON PORCELAIN.						
(a.)	The Human Figure .. ..	..	..	..	3	None
(b.)	Ornament .. ..	..	..	..	1	1st
CLASS 9.—DECORATIVE PAINTING.						
(a.)	Ornament .. ..	..	..	..	3	Two 2nd
(b.)	Ornament .. ..	..	..	..	none	
CLASS 10.—INLAYS IN WOOD (MARQUETRY, OR BUHL), IVORY OR METAL.						
	Ornament .. ..	..	..	..	1 metal	1st
CLASS 11.—CAMEO CUTTING.						
(a.)	Human Head .. ..	..	..	..	1	None
(b.)	Animal .. ..	..	..	..	1	None
CLASS 12.—ENGRAVING ON GLASS.						
	Ornament .. ..	..	..	..	none	
CLASS 13.—WALL MOSAICS.						
	Human Head .. ..	..	..	..	1	None
CLASS 14.—GEM ENGRAVING.						
(a.)	Human Head .. ..	..	..	..	none	
(b.)	Full-length figure.. ..	..	..	..	none	
CLASS 15.—DIE SINKING.						
	Human Head .. ..	..	..	..	3	2nd
CLASS 16.—GLASS BLOWING.						
	Ornament .. ..	..	..	..	none	
CLASS 17.—BOOKBINDING AND LEATHER WORK.						
(a.)	Bookbinding .. ..	..	..	..	3	1st
(b.)	Leatherwork .. ..	..	..	..	none	
CLASS 18.—EMBROIDERY.						
	Ornament .. ..	..	..	..	none	
CLASS 19.—ILLUMINATIONS.						
	Ornament .. ..	..	..	..	3	2nd
SECOND DIVISION.						
WORKS TO BE EXECUTED WITHOUT PRESCRIBED DESIGNS.						
CLASS 20.—MODELLING.						
The Worshipful Company of Plasterers, London, offer the following:—						
	Ornament.—Two prizes for bracket or truss in the Italian Renaissance style .. ..	..	..	..	2	1st and 2nd
Artisans' apprentices and students to compete for these prizes, but not master tradesmen, masters in schools of art, or those training for masters in the central school of the Department of Science and Art.						
CLASS 21.—WOOD CARVING.						
(a.)	Human figure in the round, in alto or in bas-relief. Animals or natural foliage may be used as accessories .. ..	..	..	..	7	3rd and three extra
(b.)	Animal or still life. Fruit, flowers, or natural foliage may be used as accessories .. ..	..	..	..	1	3rd
(c.)	Natural foliage, fruit, or flowers, or conventional ornament, in which grotesque figures or animals may form accessories, preference being given where the work is of an applied character, for ordinary decorative purposes, as representing commercial value .. ..	..	..	..	7	{ 1st and no 2nd or 3rd, but two extra

Amount of Prizes offered £666.
Sixty-one works sent in competition.
Amount awarded £174.

DISCUSSION.

Mr. HENRY COLE, C.B., said that the opinions he might express must be considered those of an individual, and not as representing the views of the Council of which he was a member. He thought the statistics given in the report they had just heard might lead to wrong conclusions. It was, no doubt, quite true that the number of competitors on the last occasion had decreased; it was also true that the number of prizes offered was much larger; but neither of those facts, to his mind, warranted altogether the somewhat dolorous tone which he thought pervaded the report. In the concluding paragraph a question was asked, what had led to "this state of things?" and "can any steps be taken by which a larger number of competitors can be secured?" He did not sympathise in the term "this state of things" as implying anything like failure, and he would address himself at once to the question, as to how a larger number of competitors could be obtained? He would, in the first instance, dispose of the conclusions which seemed fairly deducible from the last competition. Art workmen were not like mulberries, to be produced at will in great numbers. It was not merely by increasing the amount of prizes that a larger number of competitors could be obtained. In the first place they must recollect that the competitors were artisans, who had to produce these works in addition to their daily occupation. Now it was not very amusing, when one had been engaged upon work, however interesting, all day, to take up the same thing again in the evening. He therefore thought, though he thoroughly sympathised with the movement, that it was asking a great deal from a workman to invite him to do work under such circumstances, and if he responded to the invitation, it was a good sign. His own opinion was—and it was strengthened by the decision of the judges—that the quality of the work exhibited on this occasion was much higher than it had ever been before. That was a sufficiently satisfactory result in itself, even though the number of competitors was much less; especially as the cause of this, which was alluded to at the last discussion, viz., that trade was very brisk and the workmen were getting full employment, no doubt still happily existed. He believed that trade on the whole was very brisk at the present time, but he wished to draw attention to the fact that the number of competitors in 1863 was 70, and of these 31 obtained prizes, which was 44 per cent. of the whole; in 1864 the number of competitors increased to 96, and the number of prizes given was 27, being at the rate of only 38 per cent., so that the quality of the work would appear to have deteriorated; but in 1865, when the number of competitors went down to 61, he found that the number of prizes was 31, being 50 per cent as against 38 per cent. in the preceding year. That was conclusive evidence to his mind that the scheme was working healthily. The following tables would illustrate his views:—

Years.	Total No. of Prizes.	Total No. of Subjects not awarded.	Total No. of Subjects not competed for.	Total No. of Subjects.
1863	31	2	2	18
1864	37	3	8	35
1865	31	6	13	38

Years.	Total No. of Competitors.	Total No. of Prizes.	
1863	70	31	44·285 per cent.
1864	96	37	38·541 per cent.
1865	61	31	50·819 per cent.

Various causes might tend to limit the number of competitors, but if the judges awarded a larger number of prizes,

and thus pronounced the work to be of higher quality, it was, to his mind, exceedingly satisfactory; therefore he came to the conclusion that they need not be discouraged by the results shown. He was accustomed in his work to observe how long it took to make the public even acquainted with what was going on. He was never astonished at any amount of public ignorance; he accepted the fact, and did his best to put it right as far as it was his business to do so. He had known instances of even educated persons not being aware of the very existence of the Art Training School, which had now been at work for thirty-five years. The Society of Arts might spend a large sum in advertising this scheme, but they must be patient in expecting results; they had been at work in this matter only three years, and he thought the signs were satisfactory. A point had been raised as to whether the workmen should not be allowed to execute their own designs, and whether that would not increase the number of competitors? His own opinion was that it would not, and also that it would tend to lower the character of the work. He thought the art workmen and the class of artisans generally were not much trained as artists and designers. Years ago they had such men as Holbein, who made designs for book-covers, and jewellery, built houses, and painted pictures, but they rarely found such a combination of qualities in one individual at the present time; and he believed if they asked artisans to give their designs *plus* the execution, they would get some fearful abortions. It was enough, he thought, to ask art workmen to study really fine examples, and imitate them. We had, in fact, very few designers in this country at best. There were strictly ornamental designers, and he was happy to say these were increasing; but at present, he believed, the designers in the manufacture of pottery who were distinguished in that art were very few, therefore he thought if they asked for designs *plus* the execution they would rather retrograde than otherwise. Reverting to the question how the number of competitors might be increased, it occurred to him that if the workmen were allowed by their employers to exhibit, in addition to the class of objects for which prizes were offered were some portion of the work they had in hand, showing the excellence of their ordinary workmanship, there would not be that draw upon their time which there was in the execution of the special objects which did not come within the scope of their daily occupation. He did not mean by that that the Council should give up calling attention to the works of Raffaele and other models of excellence, but he thought such an addition as he had suggested might be advantageously made, and would tend to increase the number of competitors. He might be met by saying "manufacturers like to keep their good workmen to themselves, and not trumpet forth their excellencies." That might be true to a certain extent, but, happily, that state of mind was passing away. They found at the last exhibition both British and French manufacturers were very willing that the names of the workmen should be made known in connection with the articles they exhibited; and he believed that would be the case to a larger extent at the next Paris Exhibition. If, for instance, Messrs. Hunt and Roskell had Vechte for their chaser, and if Messrs. Hancock had Armstead, they would naturally take a pride in employing such men. The suggestions he would throw out, and to which he wished especially to draw the attention of the meeting were:—That artisans may exhibit specimens of workmanship executed by themselves in the several classes which have been produced for manufacturers—such works being accompanied by a statement of the exact share of the work which has been performed by the competitors; that portions of complete works should be admissible; that, in view of the Paris Exhibition, the Council should address manufacturers, requesting them to assist their workmen to show their skill for exhibition in Paris.

Mr. GEORGE LOCK begged to offer the following suggestions, as to the best means of improving, extending, and encouraging the cultivation by art workmen of the practical skill required in the execution of the more artistic class of work now in demand for the decorative and useful arts:—1st. The appointment of a special committee to take evidence and report thereon, as the best means of eliciting the opinions and deliberate judgment of art workmen and all parties practically engaged in the arts, which would afford an opportunity of fully considering the highly important and valuable suggestions made by Mr. Beresford Hope, and adopted in the report of the Royal Academy, relative to the introduction into the Royal Academy of a class of Associates formed of art workmen, the full particulars of which appeared in the *Journal* for July 31, 1863. Many employers and workmen, from being unused to address a large assembly, have the greatest objection to offer any remarks on such a subject before an audience like this, from the difficulties they find in concentrating their thoughts or opinions sufficiently to express them in a few minutes under exciting, and to others depressing influences. The eminent success and valuable information obtained by the Committee of the Society of Arts on the state of Musical Education is an example of collecting most important suggestions and opinions from men who would never have given them before a large public assembly. The valuable and interesting evidence obtained by a Committee of the Houses of Parliament in 1841 on the fine arts and the decoration of the Houses of Parliament, in the answers to 70 questions put to Richard Mitchel, a wood-carver, is a case in point. In the event of further competitive exhibitions, I suggest a return to the original condition of adjudicators being selected in part from the practical workmen in each trade invited to compete; also that each trade be solicited or allowed to contribute to the prize fund; and that whenever any article is specially named for competition, it should always be of such proportions, character, and completeness as will make an ordinary saleable article of the best workmanship, thereby lessening the objections of mediocre workmen to employ their time in an attempt to produce an object worth exhibiting, that in so many competitions, if not awarded a prize, has proved a loss, from the unsaleable character or difficulty of applying the work produced to a commercial purpose. That at all such exhibitions the superior work of deceased men of all ages that can be obtained should be exhibited, the wide and important influence of the Society being used to induce private owners and employers to contribute such works and encourage them to offer special prizes for any subject they may select, subject to the approval of the Council,—this for the purpose of making the Exhibition more attractive as well as instructive to the general public and art workmen. That from the limited space in the Society's rooms, and the difficulty of organising a staff of officers and attendants to any extensive exhibition, without seriously interfering with the ordinary business of the Society, it is highly desirable that application for exhibition space and accommodation should be made to the authorities of South Kensington, or, in default, some more popularly known exhibition rooms should be obtained; so that workmen, besides having a chance of a prize, might have the more coveted reward of a sale for their work, and of being introduced to the public buyers; and there might also be an opportunity for employers and foremen getting a better test of the abilities of men to suit their separate departments than they now possess, and which the comparatively private exhibition of the works hitherto sent in competition has afforded. And, lest this proposal may be deemed too extravagant to be realised, I would remind you of the notice lately given in the Society's *Journal*, of the manufacturers and workmen of Paris in the bronze, iron, zinc, and silver trades, with friends of art as honorary members, having established a society to give a number of prizes annually,

and who, in December last, held an exhibition of their works, and awarded 20 prizes, besides medals and honourable mention, for modelling, chasing, ornamentation, drawing, and founding in bronze and iron, turning, and mounting, the directors of the Conservatoire des Arts-et-Metiers having granted space for their exhibition. The society in addition appoints delegates who act as arbiters in disputed copyright in works of industrial art; they likewise grant pecuniary aid to their aged and infirm brethren. Such, I consider, affords a worthy example to be followed here. The art-workmen of Manchester, to the number of 200, have this week opened an exhibition of 400 examples of art manufacture in the hall of the Royal Institution. Edinburgh has had two exhibitions, five to seven years back, of a similar class, in the Royal Institution of that city. And the time is not far distant I trust when the art-workmen of London, not of one trade, but all, will hold their exhibitions in a hall of their own, devoted alone to the promotion of Art. Among other suggestions I would have the designers' aid enlisted, by offering prizes for the actual working drawings in full detail of any of the objects actually exhibited, or which may have been executed and fixed in places from which they cannot be brought for exhibition, but which may be thus inspected by the judges. Thus large and small architectural work, iron gates, garden decorations, &c., might be represented. The artistic guidance of such men is of vital import in the present depressed state of art taste and ability to design or draw among operatives. I consider this a most important principle to get acted upon, as more is to be gained under existing circumstances by looking at things as they now are, and helping them on in their present trade way, than by striking out a new path altogether. The works of art-workmen who are employers, or parties in business for themselves, should compete in a class of their own, forming a separate division from the journeymen, who hitherto have laboured at a vast disadvantage in their leisure hours, from being opposed by skilled workmen or employers, who had sufficient capital to devote months of labour in producing saleable articles, or that had been sold already from the retail shops, and who have carried off many of the principal prizes already awarded by this Society, but who, it should be said, have likewise been the largest and most important contributors, as Wallis, Kendall, Baylis, Perry, Robinson, Hewetson, Holmes, and others, a class of men who it is most desirable should be encouraged and supported to the utmost by this Society, as aiding in a great degree to ensure the first element of success—sufficient works being thus sent in to make up a popular exhibition worthy of the great exertions and outlay made. Their success and encouragement would act as a stimulant and impetus for other workmen to qualify themselves for business engagements beyond the monotonous toil of the workbench, more than if such a class were excluded from competition, as Mr. Hawes suggested in his reply to my remarks at the meeting or conference held in this room on December 21, 1864. That remark, which made a very deep impression on me, was somewhat qualified in the report given in the *Journal*, but it has doubtless had very much to do with the retirement of all the class of employers, whether art-workmen themselves or not, with but one exception, that exhibited here in the previous exhibitions from the present competition, as, coming from the Chairman of the Council, it led them clearly imagine they were not of the number this Society wished to encourage; and, from it not being sufficiently clear in the printed conditions or programme, that employers were to form a division alone, or were to be excluded from the competition, a great number of ordinary journeymen have refrained from executing any work, lest it should have unfairly to compete with the works of employers, but who, nevertheless, may yet be art workmen, thus accounting, in a great degree, for the paucity of specimens in the present competition. Again, in judging the

works of these two divisions or classes, I would suggest that the past and present standard of excellence, as adjudicated on by this Society, should be continued for the division of works exhibited by the employers, as well as Art workmen, who also may be employers or in business for themselves. But it is manifest to those practically acquainted with the present state of wood and stone carving, metal workers, decorators, ceramic workers, and other art branches, that the number of journeymen who can independently produce a finished high class work of art industry in their leisure hours is so very small, that, as in the case of the wood carvers, nearly all in the west London trade that can at all conveniently spare the time have already competed; yet how trivial and insignificant is the result; whilst the provincial workmen, as a body, yet remain in entire ignorance of the whole scheme of art workmanship competition, both here and at South Kensington, for want of explanation and greater publicity. Until design modelling and drawing are more generally admitted as a necessity, for a good skilled workman to possess, no numerous specimens of high class can be expected in such competitions; therefore I would for a few years award a much larger number of prizes, lowering the standard for journeymen, as an encouragement to employ more frequently their spare time in executing works for exhibition, as is done with the probationary or elementary classes in our schools of Art; for very strong prejudices and old habits have to be removed from among the class of well paid workmen to induce them to compete and exhibit under the most favourable circumstances. They should also have every aid possible afforded for the sale of their works, by the exhibition being held in some popular place, and made as varied and attractive to the public as possible. The exhibition should always take place between February and June, and eight or nine months' notice be given of the condition to be worked on; it should be opened as quickly as possible after the specimens are sent in, the awards being made within one month, or as soon after opening as can be. The public should be admitted two evenings in each week it remains open, free, or at a very small charge. The distribution of prizes should take place a few days before closing, and be in public. Such acts would serve as an impetus to all concerned to examine and scrutinize still closer. Thus the art workmen and employers would be more willing to part with important works recently executed, or old work as examples from their stock for a period of two or at most three months, in lieu of the many months the competitors and exhibitors had their works retained in this house without the general public seeing them, or the prizes being distributed; and which I know has operated, with several large exhibitors, in a way most injurious to the progress or success of this and future exhibitions by their non-appearance. As many of these suggestions have been urged by me most strongly on several former occasions in this room, and through the medium of the press, and have likewise been made by others of much greater experience in art education, Messrs. Digby Wyatt, Cole, Beresford Hope, Godwin, and many more, I do trust therefore that with the support of the Council no obstacle, either in or out-doors, will be allowed to obstruct the progress of this great movement, made with the vast influence and resources of this great Society. We ought to look on the present state of the art workman's education generally, as well as that displayed in the few clever works sent in, creditable and meritorious as most of them are to their producers, as but the knowledge and skill of mere children in art compared with what man has produced in former years, and may yet fairly seek to excel with the advantages now to hand. I must again urge, as a strong suggestion, a still more extensive publicity to the Society's schemes, by seeking the co-operation of all Institutions in Union, the Workmen's Club Institute, the secretaries of all the Working Men's Exhibitions, metropolitan and provincial, the City trade

companies, the chairmen of Halls of Commerce, the masters of the Government Art Schools, likewise some of the ordinary trade societies, and by advertising extensively in those newspapers and periodicals that are known to circulate by hundreds of thousands among the entire working population of the country. All this and much more can be done legitimately to prove the earnestness of the Society to elevate the state of the workman's art skill, and doubtless would tend to enhance its already great fame, vast influence, and resources by attracting fresh members. In conclusion I beg to recall your attention to the generous encouragement afforded a century back by this Society to aid progress by the prizes awarded to Thomas Banks, for a design for furniture, two models and two works of sculpture exhibited between 1763 and 1769, to the amount of 105 guineas; and the like sum between 1759 and 1761 to Nollekens, the sculptor, for four works; to John Bacon, over £200, his first work being sent in in 1769, when 19 years of age, besides the gold medal for his statue of Mars, which, with its companion figure of Venus, he presented to the Society, with the accompanying letter, which cannot be too widely known:—"The honour you have done me in your acceptance of my statues of Mars and Venus affords me an opportunity, which I gladly embrace, of acknowledging the many obligations I owe to the Society. It was your approbation which stimulated and your encouragement which enabled me to pursue those studies which a disadvantageous situation had otherwise made difficult if not impossible. Believe me, gentlemen, I never think of the Society without gratitude and without the highest idea of the principles on which it is formed, and which justly place it among the institutions that do honour to human nature, raise the glory of a nation, and promote the general good of mankind." This was the work and the reward this Society obtained for its labours a hundred years since. Should it rest or be satisfied with less now? I say, a hundred times, No!

Mr. HARRY CHESTER confessed he shared the feeling expressed by Mr. Cole as to the dolorous tone of their secretary's report on this subject, and he was glad to find they did not after all regard this movement as a failure and were not discouraged in it, but that the object of the present meeting was to endeavour to carry out with greater success than hitherto the work which they had had in hand for these three years past. He had listened with interest to the remarks of the last speaker, and he thought he and Mr. Cole together had hit upon the real causes why this movement had not succeeded better. Far from being discouraged at the amount of success, he felt rather surprised that in so short a time so much had been done. This Society should certainly not despise "the day of small things," for they all knew that the great exhibitions of 1851 and 1862 had originated from very small beginnings. The question was, whether or not they had made a good beginning, and whether the encouragement of these competitions was likely to be useful to art workmen? If so, they should not be discouraged by trifles, but get the best information they could for improving their course, and pursue that course with energy and determination. He approved of the suggestion of Mr. Lock, that a committee should be appointed to ventilate this subject more fully. He thought one reason why they had not succeeded better was that they did not sufficiently understand the mind of the art-workman, and he did not sufficiently understand the mind of the Council. Another point on which the secretary had expressed himself somewhat unhappy was, the small response that had been made by the great City companies. He (Mr. Chester) would say he was surprised they had made any response at all. He considered that the application to those public bodies had not been made in a way calculated to lead to any great amount of response, a circular only having been addressed to them, asking them whether they would subscribe to an art prize fund. He thought the subject had

not been approached with sufficient gravity, and that a more forcible appeal should have been made. There were two companies which especially deserved notice in connection with this matter, viz., the Harness Makers' Company and the Painters' Stainers' Company,—the latter being the first to inaugurate exhibitions in connection with their own branch of industry, partly from their own funds and partly by a grant from this Society. Those exhibitions had been of a highly satisfactory character. He hoped the subject would be discussed in all its bearings, so as to see in what manner the object they had in view could be best carried out.

Mr. PETER GRAHAM said there were two points on which he would offer a few observations. The first was with regard to the excluding of works which were the designs of the workmen themselves. He differed from his friend Mr. Cole on that point. He did not think it wise to exclude the designs of the workmen who executed the work, though works executed from prescribed designs should still be retained. He fully concurred in the suggestion that the large employers of art-workmen should allow completed works, or portions of works on which the men were engaged, to compete on these occasions. He believed that would tend largely to increase the number of competitors, and make the objects exhibited more interesting. Those, of course, would not be from prescribed designs. As a large employer of art-workmen himself, he should only be too happy to act upon that suggestion, and he believed a great many others would do the same. He agreed generally with what had been said by Mr. Cole, and also very much with what Mr. Lock had stated.

Mr. HENRY MAUDSLAY would not have risen on the subject of art exhibitions, knowing very little about them, but as a tabulated statement had been prepared by the secretary, he would himself read one deduced from it, which he thought would illustrate the subject still further:—

Years.	Exhibitors.	Amount of money offered.	Proportion of money to competitors.	Prizes awarded.	
1863	70	£162	2	£109	} £165 more
1864	96	623	7	274	
1865	61	666	11	174	} £100 less

It would be seen that in the year 1863 there were 70 exhibitors, and the amount of money offered was £162, the amount of prizes awarded being £109. The proportion of money offered to competitors was about two pounds to one, as shown in this table. In 1864 there were 96 exhibitors, the money offered was £623, and £274 was given away in prizes, the proportion between money and competitors being seven to one. In 1864 there was £165 more given in prizes than in the preceding year, proving that the proportion of competitors to the amount of prizes awarded was considerably smaller. In 1865 there were 61 exhibitors, the amount offered being £666, and the proportion between this and the number of competitors being 11 to 1. There was £174 given in prizes, but though the proportion of prizes was so large, there was £100 less given to the competitors. Taking that as the result, he thought the views taken in the report of the Secretary were borne out by the facts, and that the progress of this art workmanship competition had not been such as they might have expected. With regard to the efforts made by the city companies for the encouragement of art, he thought the exhibition held by the Ironmongers' Company was deserving of mention as one of the most magnificent that had ever taken place in the metropolis.

Mr. FIGGINS, jun., remarked that there were three great interests to be regarded in connection with these exhibitions:—First, the advantages resulting from them to the art workman himself, as a means of introduction to constant and remunerative employment. The next

interest to be considered, was that of the employer of labour, who was aware of the advantages of having an intelligent and educated class of men to deal with rather than ignorant men. The third interest was that of the public at large, for by creating these competitions, and improving the taste of the workmen, they best fitted them for maintaining the proud position which this country held in regard to manufactures in all the markets of the world. He thought the interests of the art workman had been put in too prominent a position. This was shown in the first Industrial Exhibition that was about to take place in the City of London. In the first place they invited competition in works of art, for which prizes were to be given, and then they invited the employers of labour to permit the men to use their time, money and tools, and the resources of their establishments to produce something for the benefit of the art workman himself. Such a thing was, in his opinion opposed to all commercial morality, and must tend to set people against these exhibitions. To make these competitions successful they needed the united support of all classes, and in order to obtain that, the interests of all classes must be considered.

Mr. ASHE addressed the meeting at some length in favour of practical men in the usual branches of manufacture being associated with the judges in the adjudication of the prizes, without which he argued there was no security that the rewards would be bestowed upon the most meritorious workmanship, as no one but an actual workman could detect blemishes which were often intentionally concealed by putting false surfaces on to the work. He expressed his desire for the appointment of a committee, including practical men, to carry out the modifications in these competitions which the progress of events called for.

Mr. MACKENZIE (of Sheffield), without going into the many points touched upon, would confine himself to one only. When he saw it reported that a smaller number of works had been sent in this year it struck him as a singular circumstance, inasmuch as this annual competition had become better known in the provinces by means of advertisements in the different local papers. He had done his best to stimulate the artisans of his own town in this direction, but he regretted that the results were anything but satisfactory. He had done so especially amongst his own class—the engravers—and the young men connected with him in trade, but there did not seem to be any great amount of ambition amongst them to forward themselves in their career in life. They simply looked to “Saturday night,” and did not look further. On the whole he would say he felt very disheartened on this account, as he regarded these competitions as a great means of raising the art workmen of this country to the position which they ought to occupy. Speaking from his personal experience he could say that he had derived the greatest benefit from the study of the higher works of art with which the public depositories of the metropolis were so richly stored, and in the facility of access to those objects: the art workmen of London possessed great advantages over those in the provinces, where those means of study did not exist, or only to a very limited extent. He had made it a point to spend a week or ten days in London every year for the purpose of improving himself in this respect, and he was sure the same plan would result in great benefit to all others of his class who adopted it.

Mr. R. W. MARTIN suggested the desirability of a certain amount of encouragement being given at these exhibitions to original designs in art workmanship, and thought some prizes might be specially appropriated to that purpose. He did not wish to see the workmen of this country always remain mere copyists; but he was desirous to see their abilities displayed as designers—a class of men which was very much wanted at the present day.

Mr. MACDONALD thought it would conduce to the success of these competitions if the competitors were allowed

to a certain extent, to execute their own designs, and he concurred in the desirability of appropriating a portion of the prize fund to that object.

Mr. R. REDGRAVE, R.A., remarked that the works sent for competition might be divided into three classes, viz., those which were imitative reproductions; those which were reproductions with some degree of translation into another manner; and those which had a certain amount of originality of design. He believed he expressed the opinions of the gentlemen who acted with him as judges in saying that the first of these were generally well done, the second not so well done, and the third were on the whole ill done. In cases where the design originated with the exhibitors, a great want of taste was evinced; and the judges were really puzzled to know how to reward good workmanship which was combined with such bad design. With regard to the Schools of Design, they had now a considerable amount of experience. The competitions in those schools throughout the country for the prizes offered by the Government were unfettered by conditions, and prizes of from £10 to £25 had been offered to students, for designs to be sent to the central authorities for adjudication. That system was continued for several years, and was only abandoned in consequence of its not being responded to in a manner commensurate with the amount of the prizes offered. With that experience before them the Society of Arts was asked to encourage prizes for original designs, but, in his opinion, it was desirable that the art workman should first understand thoroughly what good workmanship was; but, if the Society was, after all, disposed to encourage design, it would be well, he thought, that this should form a class apart. If the response had not been very great when the design of the object was given, he thought it would be less if exhibitors were asked to work out their own designs. As to the advisability of asking manufacturers to permit their workmen to send works executed for them, either as completed works or portions, he thought this would be a good thing, but the difficulty would be in sparing the work for the length of time that was necessary. There were some difficulties in what were called translated designs, as, for instance, from a photograph into colours; and the mode in which the colouring was applied often showed that the workman had not taken much pains to examine the original of the work he was about to reproduce. This remark applied especially to the works of ceramic art sent in to their competitions, the colouring of which rather resembled gaudy china painting than the softened tints of the original of Raffaele. In the *repoussé* work in the model of the same painter's "Three Graces," there appeared to be difficulty in translating from the flat surface into relief in metal, and on each occasion the judges had been unable to award a first prize in that class. There were some points on which the services of the workmen in aiding in the award of the prizes would be valuable, such as in detecting any attempts to disguise bad workmanship. He thought, upon the whole, that the results had not been discouraging. He had noticed that the names of successful competitors of former years appeared again in the same branch of the competition, which he thought was hardly desirable, and works which had obtained prizes here were sent again and again to compete in the various industrial exhibitions. Moreover, art workmen should aim at something higher than the mere sale of their productions, and should show some disposition to acquire name and fame. The Government had consented to purchase some of these works, which would be placed side by side with the best works of all ages, at South Kensington, and this, he thought, the producer could not but regard as a high honour. He was quite sure the various suggestions that had been made that evening would receive the fullest consideration from the Council.

Mr. LAVANCHY expressed a hope that the question of offering prizes for original designs would receive from the Council the consideration which he thought it de-

served. In all the exhibitions he had visited, in this and in foreign countries, the designs carried out by the artisan himself always attracted the greatest amount of attention. He hoped nothing would be done to restrain the facility of original design, but that provision would be made, as far as possible for its development in these competitions.

The CHAIRMAN said he might take upon himself to promise, on behalf of the Council, that the various observations and suggestions which had been made this evening would receive the most careful consideration. There were, however, one or two points in which he saw some difficulty in acceding to the wishes of some of the speakers. In the first place the panacea sought to be applied to difficulties of all sorts, whether in great public companies or in the House of Commons, had been proposed, namely, a reference to a committee. He had himself acted on a vast number of committees, and he could say it was only a very small percentage of those committees that had produced any practical results. It was true that there was at the present time a committee of this Society sitting on the subject of musical education, which was presided over by the gentleman who first addressed them, with an energy and ability which would no doubt end in valuable practical results. He thought it was important to encourage the love of music among art workmen, for it tended to elevate and refine the mind, and withdraw those who cultivated it from depraved tastes and habits. He confessed that he did not see what such a committee as had been suggested could do on the question now before them? Possibly a few of the most intelligent working men might be asked to meet the judges on some occasions, and a committee of the Council on others, to talk over the best mode of more effectually promoting the objects they had in view. The suggestions made this evening had been first those of Mr. Cole, that the manufacturers should allow their artisans to send in competition portions of the particular works which they had in hand. No doubt a great many masters would consent to that, if they could be assured that the works would be returned to them within a limited space of time. He hoped the time was coming when masters who produced work of a high class would feel pride in attaching the names of their workmen to those productions. Mr. Chester, in speaking of the great City companies, appeared to think the Council had not approached them in a sufficiently pressing manner, in having merely issued a circular, which was not responded to. He thought, however, that the mode of address, which was in fact the usual one, was of little importance. It was not creditable to the ninety great guilds of London, with incomes varying from £50,000 to £1,000 per annum, that only two of them had responded to that appeal. With regard to the report which had been laid before the meeting this evening, he confessed he did not think it was written in the dolorous spirit which his friend Mr. Chester had spoken of, or that it was really discouraging. Let them look to the proceedings of the Society in respect of education. They began with examining about 50 young men about ten years ago, while on the last occasion they had nearly 1,500. This, however, had been a work of time, and in the present case they had prejudices to overcome and sympathies to enlist; he believed in a few years great progress would be made in these competitions. The suggestions made this evening, as far as they appeared to be improvements, would no doubt be adopted, and all that remained to ensure success was that the workmen themselves should help this movement forward. With regard to the question of offering prizes for designs, it must be remembered that the designer was a person of different education, and in a different position to the workman. It was not the object of the Society to offer prizes to that class, as there were already many institutions open to them in which they could compete. He did not think the time had yet arrived when they

could say to the workman, "Execute your own design," for it was very seldom that any great work could be produced by one hand alone. The encouragement of the designer and of the workman were two distinct objects, and he thought they would do right to confine themselves to encouragement of the workman, leaving the designer to the care of the Government schools. There appeared to be some misunderstanding as to what he had said on a previous occasion, in reply to one of their most able and intelligent co-operators in this work—Mr. Lock. It had been said that he (the chairman) discouraged works being sent in by the employers of labour as distinguished from the art-workmen. It was true he did say so. The object they had in view was to obtain and publish the name of the skilful workman—not the name of the employer of labour, who might not do proper justice to the man who produced the work. The object of the Society was to bring forward the workman—to make him feel his own importance, not to encourage the employer of labour. With regard to the point that the objects selected for competition should be of a character generally saleable, he would say that the end in view was rather the promotion of the advancement of art than the production of saleable articles. If both could be combined, well and good. With regard to the decisions of the judges, there was no doubt that the gentlemen to whom that duty had been assigned were all most eminent in their respective vocations. This had been the case on every occasion of these competitions, and, although this year they had unfortunately lost the services of Mr. Webb, through illness, they had replaced him by a gentleman who was an amateur of acknowledged taste and ability. He might mention, in conclusion, that at the next meeting a paper would be read by a gentleman who had taken an active part in organising the Anglo-French Exhibition, held last autumn, and who was now endeavouring to promote a union between English and French workmen. He (the Chairman) hoped the working men of this country would find the means of visiting the next Paris Exhibition in large numbers; and although the time for receiving applications for space was drawing to a close, he thought, after hearing the paper to which he alluded, it would be considered advisable to apply for a space, even though it should be a limited one, in that exhibition in which the skill of the English art-workman would be adequately represented in competition with that of his French rival. He was sure the Council would be glad to receive any written suggestions with which gentlemen connected with Industrial Exhibitions in the provinces, or others interested in this subject, might favour them.

On the walls were some specimens of modelling in Keen's cement, lent by Mr. Reginald Palgrave, with a view of calling attention to this material as valuable for the use of art-workmen, and the following letter has been received by the Secretary:—

DEAR SIR,—You kindly expressed a wish that I should put down, in a few words, my experiences of modelling in Keen's cement. I need not point out the advantages of modelling in a material as durable as stone. The mode of working it is very simple. Mixed up with just enough water to form a stiff paste, it accommodates itself to the touch of the modelling tool, very much as clay does. There are two inherent difficulties in using it—one, it is not so tractable as clay; the other, that if not kept supplied with sufficiency of moisture, the finer touches are apt not to set—the portions, I mean, of the cement which applied to a ground work of set material are too thin to retain moisture until the act of setting be completed. This may, however, be, I think, almost completely guarded against by soaking the slab of cement—the basis on which the bas-relief is moulded—well before commencing to work on it. This soaking

will not injure the completed portions of the model, as water will not soften the cement if fully set. That was my mode of working. I cast a slab of the cement on a wax board or sheet of zinc; when set, after soaking it well in water, having wetted as slightly as possible a sufficiency of cement in a saucer, having laid on the slab as much cement as I could hope to perfect within the limits of my sitting, the cement by degrees, as the extreme moisture dried away and the firmness of approaching setting commenced (it takes six hours to set completely), became more and more workable, till at the close, by the usual process of adding on roundness to the surface, refining away the edges, as is practised in the clay, the cement will receive a considerable amount of finish. I must confess that, with the defective powers of an amateur, after the model was set I have been accustomed to touch it up with sharp tools, and rasps and files used by jewellers (and I fear dentists). As, however the touch on the soft yielding material is the true charm of modelling, in this I feel I lost sweetness to gain precision. Nor is the cement so ductile, so firm, nor yet so silky as clay; in these highest qualities it seems to me inferior. To show, however, what can be done with it with wooden and ivory modelling tools, I send a rough slab uncleaned up. The "Lastrea fern" and the "Hart's tongue" are wholly untouched by steel implements. I think I have fairly explained the deficiencies of cement as a modelling material. It is also slower to work than clay, from being too incoherent, when very wet, to receive impress, and from being too stiff when under work for some time. The middle stage, if there is just sufficient water to render it ductile, and just a sufficiency of dryness to make it workable, is not of long duration. Nor does it lend itself to sketch with as clay does. Amateurs are apt to start "night-mares." Either the "night-mare" of difficulty where there is none, or the more misleading phantom of advising the use of a material incapable of the highest effects in art. This is what I am afraid of. Still, in hands more capable than mine, possessing as the cement does very certain advantages, it might, perhaps, prove a really efficacious material. It is for this reason that I am much indebted to you for allowing me to trouble you with this explanation, and for your kindly expressing a wish to see the few studies that I have been able to make.—I am, &c., REGINALD PALGRAVE.

Reigate, Surrey.

PARIS UNIVERSAL EXHIBITION OF 1867.

The Emperor, the Empress, and the Prince Imperial received on Sunday, the 25th February, the Commissioners of the Paris Exhibition.

The Emperor, in announcing the appointment of the Prince Imperial as Honorary President of the Commission, said:—"My son is at present too young to take an active part in your deliberations, but he will at least have an opportunity of learning in good time to honour labours which secure the prosperity and splendour of the State."

Obituary.

The unexpected death of Colonel the Hon. Sir CHARLES BEAUMONT PHIPPS, Keeper of her Majesty's Privy Purse, is certainly a loss to the Society of Arts. When the Great Exhibition of 1851 was being matured, he gave to the scheme most important aid, and took a warm interest in its organisation. Sir Charles expired shortly after five o'clock on Saturday morning, 24th February, at his residence in the Ambassador's Court, St. James's Palace, after an illness of only two days, from bronchitis. He was the second son of Henry, first Earl of Mulgrave, by Martha Sophia, daughter of Mr. Christopher Thompson Maling, of West Herrington, county Durham,

and was born 27th Dec., 1801, and married 25th June, 1835, Margaret Anne, second daughter of the Ven. Henry Bathurst, Archdeacon of Norwich, by whom he has a family of two sons and two daughters. Sir Charles was formerly in the Scots Fusilier Guards. He was secretary to his brother, the late Marquis of Normanby, when that nobleman was Governor of Jamaica, from 1832 to 1834. On the late Marquis of Normanby going to Ireland as Lord-Lieutenant, he was appointed steward of the vice-regal household, which he held up to 1839. After acting for a short time as secretary to the Master-General of the Ordnance, he was, in August, 1846, appointed an Equerry to the Queen. In December, 1846, he was made private secretary to his late Royal Highness the Prince Consort, and remained so till the death of Mr. Anson, who for a short period succeeded Sir Henry Wheatley, made Keeper of her Majesty's Privy Purse, and treasurer to the late Prince Consort. At Mr. Anson's death Sir C. Phipps took his office, and became also treasurer and cofferer to his Royal Highness the Prince of Wales in October, 1849. He was made Receiver-General of the Duchy of Cornwall in 1862, and in January of the following year was appointed one of the Council to the Prince of Wales. He was nominated a Knight Commander of the Civil Division of the Order of the Bath in recognition of his faithful services in her Majesty's household. Since the Prince Consort's death he has been one of the most intimate counsellors of her Majesty, especially in all those matters which were not affairs of State, and many persons have had reason to feel the influence of his kind services. His loss is a severe one to the Queen and the Royal family and to many of her subjects.

Publications Issued.

THE CATTLE PLAGUE; with official reports of the International Veterinary Congresses held in Hamburg, 1863, and in Vienna, 1865; now first published in English, by John Gamgee, Principal of the Albert Veterinary College, London, late Principal of the New Veterinary College, Edinburgh, &c., &c. (*Hardwicke*.) This work, which is illustrated with plates and woodcuts, is intended to supply the want of a complete history of the Russian cattle plague, which has been raging in Great Britain since the month of June, 1865. Part I. contains an introduction, besides an exposition of the causes, symptoms, nature, results of *post-mortem* examinations, of microscopic and chemical investigations, treatment, and means of preventing the cattle plague. The preventive measures adopted by Government, and the report of the royal commission appointed in 1865 to inquire into the history and character of the plague, are also appended. In this part are included original investigations as to the speedy recognition of the disease by a method of watching the temperature of animals, whereby an opportunity is afforded for the early isolation of affected ones. The results of investigations by Dr. Arthur Gamgee, as to the changes which take place in the blood and in the secretions of the body in the course of the disease, are also given. Under the head Prevention, special attention is paid to all suggestions hitherto made, and especially to a system of national insurance to protect stock-breeders and farmers against loss by death. Part II. is devoted to the history of the plague at home and abroad, also to the present history of the plague, passing in review the outbreaks in Great Britain, Holland, Belgium, and France, with complete details on the manifestation of the disease in the gardens of the Acclimatization Society in the Bois de Boulogne, Paris. Part III. contains official reports of the two International Veterinary Congresses, held in Hamburg and in Vienna. The first was originated by the author of the present work, at a period when he was strongly impressed with the importance of attention being specially drawn to the possibility of the introduction of the cattle-plague into this country, as also to the general

question of the spread of contagious diseases in animals between different countries.

A METEOROLOGICAL DIAGRAM FOR THE YEAR 1865. By C. O. F. Cator, M.A. (*Edward Stanford*.)—This is lithographed in colours, on one sheet, about 48 inches by 20, and shows at one view the daily variations of the barometer, thermometer, and wind; also the depths of rain daily; the weekly number of deaths in London; the weekly fluctuations in the imperial price of wheat; the changes of the moon; and various other particulars. A blank form of the same size is published, arranged for the entry of their own observations by observers in other parts of the country. This form is so arranged as to render it equally available to the meteorologist, statisticist, and medical man, who could readily trace by it the connection between atmospheric variations and the fluctuations of disease.

Correspondence.

SHOULD RAILWAYS BE THE PROPERTY OF THE PUBLIC?

SIR,—I regret that the discussion of this great question on the 7th February was all on one side; and I should have been glad, had time allowed, to have said a few words in support of the policy recommended by Mr. Galt and Mr. Chadwick. Perhaps you will allow me to do so in your *Journal*.

Twenty-two years ago Sir Robert Peel laboured to recuperate the country from the cardinal blunder of his railway policy, by directing the introduction of a measure to provide for the optional resumption by the state of the railways of the country. Mr. Gladstone took charge of the bill, carried it into an Act, and has appointed a commission, which is now sitting, to report upon the expediency of the principle. It is my belief that these statesmen have really had a purpose in what they have done; and all that Mr. Hawes can say will not convince me to the contrary.

"The roads of a country," observes the Select Committee of the House of Commons, "from the very nature of things, are public concerns; they are as necessary to the people as the air they breathe." All the highways of England are the Queen's—all the parish roads are the property of the public. Not one of them is the subject of private profit—the whole people are taxed to make and repair them. Each of them is under a trust for the public benefit: any traveller in the kingdom may indict their trustees if they are left in disrepair. It is the same with navigable rivers and the *littoral* of the realm. They belong to the state—every subject is free to use them—they are deepened, widened, embanked, lighted, buoyed at the public expense. The Trinity House, the river trusts, tax the shipping, native and foreign, for their support. They are the property of the whole nation—they are not the subject of private profit. What, then, means all this cant about the virtue of private enterprise, and the vice of Government interference in reference to that highway which has superseded both river and road? How many honest interests have railways utterly destroyed? How many road and river trusts have they made insolvent? For what did they come to parliament to ask for the delegation of imperial powers, to stand in the room and place of the state, to take men's land, to pull down their houses, to dispossess the poor, to change the current of trade, to make and mar towns, but solely on the preamble of advantage to the public service? These roads are the highways, even the byeways of civilisation. Why are they to be taken out of the category of other public property, appropriated by irresponsible private subjects, made mercantile adventures, conducted in shares for dividends? The question really answers itself. Every farthing taken from the public more than the bare cost of construction and maintenance, is a misappropriation of the public money—of a tax levied on, and paid by, the whole nation.

All the nonsense about centralisation and bureaucracy so freely used in this controversy, comes too late. The roads, bridges, and rivers of the country have belonged to the State, or its trustees, ever since the Romans began to make them. When the cost of construction and maintenance has been defrayed, they have been untolled. Where peculiar privileges have been given to individuals for public works, it has been solely on grounds of general advantage—profit to individuals being purely incidental. The *onus* lies entirely upon the “railway interest” to show why that species of highway should be taken out of the general category. It is not enough that Mr. Hawes should show the evils of Government interference. If that be an evil, it does not follow that railways, in place, like other roads, of being held in trust for the general good, should be the private property of shareholders—many of them aliens, none of them necessarily connected with the country through which they run—to levy usurious dividends for individual gain. At one time our customs and excise were farmed, letters were carried and delivered by private enterprise,—most of our taxes were levied by contract. All these functions have been redeemed by the state. Why should Government carry letters, any more than passengers or goods?

We are told, indeed, that Government does everything badly—that the stimulus of private interest is requisite to produce proficiency of management. But are railways private? Have they any of the elements of individual interest about them? What are any of the great railway companies but an *imperium in imperio*? how often, and how much, do the directors attend and do?—is their management a bit more personal than—is it even so personal as, that of our secretary of the navy in our arsenals? What are many of the directors of these vast national concerns but show-names, perhaps with influence in parliament, sitting at the board once a week, fortnight, or month. They are dealing with other people's money, and taxing the public as they please. What magic is there in a railway board table that it should qualify the very men to manage business well, which, when they direct the state concerns, they manage badly?

Is it in the least true that Government produces inferior administrative results to those of railway directors? If you can show me a single private establishment better conducted than our Customs and Excise, I will give up the whole case. Is there any work more complete than the business of our registrars and our census; of our emigration commissioners, of our factory inspection? The administration of the poor, left to local self-government, was the scandal of the country. By universal consent it was assumed by Government; and while indigence is infinitely better cared for, and the population has doubled, the business of relief is more cheaply and efficiently done, while pauperism has not only relatively but positively decreased. The constabulary is another Government department, of such unrivalled excellence that there was an universal clamour for depriving the corporation of the City of London of the management of their police, and handing it over to Sir Richard Mayne; and, in Ireland especially, that body discharges the most arduous and critical duties with singular aptitude. Fewer accidents per cent. happen to our Navy than to our mercantile marine; and if our army is expensive, from the absence of conscription, what troops in the world acquit themselves better? Strange as it may seem, I make bold to go still further, and to maintain that our Government “manages” a third of the surface of the globe, and a fourth of its population, in 45 dependencies, better and more cheaply than any board of directors or any other government. The working expenses of our railways at the last returns were £15,027,234; and of our whole Government, even in its present abnormal state, they were only £39,000,000, while on its normal scale—even under the Duke of Wellington's administration, and an un-

reformed House of Commons, they reached only £24,000,000. Where are we to look for a greater return of efficiency for so small an outlay? Above all, I advance the case of the Post-Office,—all-pervading—penetrating everywhere,—found in every hamlet, from Land's End to John-o'-Groat's,—aye, from the equator almost to the poles,—as proof of the vastest, the best managed, the most profitable, and the least burdensome institution that the world has produced. The virtue of the example is that the service is *ejusdem generis* with that of railways. It is a business of collection, conveyance, and delivery. It is universal, homogeneous, and uniform over the whole kingdom—the whole world. You see at once that the very sort of management in operation in the Post-Office is just that which would succeed in directing railway arrangements,—that they ought to go together,—that in one sense they do go together. What is Mr. Hawes' “wise saw” on this “modern instance?” It was not the Government, he says, that adopted the principle of our uniform penny postage, but Mr. Rowland Hill. It is not ministers who manage the department, but Mr. Rowland Hill. I might retort, it was not the miners and ship-owners who adopted steam, but Watt and Boulton; it was not the capitalists who took up the locomotive, but George Stephenson. The Post-Office was well managed before Mr. Hill had anything to do with it. His invention was a fiscal, not a mechanical or organic arrangement. It was not his, but Adam Smith's and Huskisson's—that simply of the profitability of cheapness. Be it what it may, however, Mr. Hawes argues that its successful management by a government department was no evidence of ministerial efficiency, because ministers positively refused to adopt Mr. Hill's scheme until they were forced to do it. Need I say it is not the scheme in which consists the character of the management, any more than it is the principle of steam or of the locomotive in which consists the test of management by directors. In both cases it is the practical application of it that falls to the executive, and that in the case of the post-office is the work of the Government. But why did ministers refuse to adopt Mr. Hill's plans? The answer to that query is my reply to Mr. Hawes, and it really settles the whole cause of Government *versus* Directors. Ministers could not afford to lose the revenue to which the scheme required them to submit. They were assured the loss would be speedily made up. They did not believe that, and they were perfectly right. The expenses largely increased—the revenue regularly diminished—the correspondence of the country was promoted at a positive loss, in the place of a large previous profit—in short, the state directors were without a dividend, and their working expenses were doubled. Nobody but the nation at large could afford the experiment; there was a strict *concursum debiti et crediti*—the same persons who lost the revenue, gained the saving in the cost of postage, and the extension of internal communication. The process was self-adjusting—it was the same people taxed more in sugar that were less taxed in postage—what was taken away by one impost was restored by the saving in another. The community at large could lie out of their money and increase their outlay to attain an ultimate advantage which private persons or companies could not afford to wait for; and it is just because the Government could undertake an experiment, to which private enterprise is wholly unequal, that our letters are carried with lightning speed and unerring certainty and safety 700 miles for a penny, at a handsome and growing profit to the state. Government alone can afford the temporary loss of revenue which would result from a reduction of fares to prime cost; but if it will wait the result of the development of the effects of cheapness in the carriage of men and goods, as it has done in the case of letters, its reward will be the same. At once what it loses in fare and freight will be made up by the prodigious increase in trade, and consumption of taxable commodities; what the public pay in additional taxation to make up the loss it will save in

freight and fare; and ultimately the nett revenue will be greater than ever, while the prosperity arising from the consequent expansion of commerce will make the temporary sacrifice an eminently profitable operation. Only Government could have given penny postage—only Government can afford at once cheap and profitable transit.

Before proceeding to compare the probabilities of the efficiency of Government railway administration with that of actual railway management—for which I fear I must crave the indulgence of your space for another letter—I shall conclude this by an examination of some of the objections which are preferred to ministerial control.

We were told, with patriotic indignation, that Englishmen never submit to the dictation to which foreign subjects bowed. "I am not," says Sairey Gamp, "a Rooshan nor a Prooshan." No—and that's the reason why the patriotism is all thrown away. In Russia, "all are equal before the stick," and we know how little freedom there is in Prussia. The truth is that in most foreign states the Sovereign rules—in England, the people. Government railway management in France means Persigny concessions, or De Morny lines; in England it imports that the people's representatives do the people's business, and that every mistake is challenged in the House of Commons. In fact government management means in England self-government; it means the transfer of administration from private directors, responsible to nobody, and whom the public never see and can't get at, to the servants of the state, daily accountable face to face in the House of Commons—to every one of the 658 representatives of the people. Not an accident could happen, not an overcharge be made, not an irregularity be committed, or an inconvenience prevail, without instant challenge, exposed in every newspaper throughout the kingdom. Where is the dictation? In directors that you cannot get at, or in secretaries of state who must answer for their work every day? Are directors responsible to their shareholders? To every appeal they flourish proxies in your face, and defy their own constituents. Besides, for what would the latter call them to account? For injury to the public?—Not at all; it is far more likely that they would cashier them for sacrificing a quarter per cent. temporary dividend, to the safety or convenience of the public.

But directors are fond of alarming us with anticipations of the corruption that would follow the cession of railway patronage to the state. *Quis tulerit Gracchos de seditione querentes?* Who have the patronage now?—Directors. What use do they make of it?—Sometimes to get themselves elected as members of Parliament by the votes of their own nominees. Who returns the members for Southampton?—Two steam-packet companies, under contract to the Government. Whom do the servants of these companies return?—The directors—amicably dividing the representation between them. I might instance the case of Harwich, and the curious history of the Galway Packet Company. Go wherever there is a railway depot—a port that has an auxiliary packet service—a great centre of traffic—and find out the history of representation.

The very greatest danger that at this moment threatens the independence and patriotism of Parliament is, that it numbers among its members so many railway directors and large shareholders, who overawe the Government, who combine to defeat the public interest and accommodation,—who conspire to frustrate wholesome competition,—whose primary object in getting themselves elected is, not to serve the country, but themselves. It is said that electors have even made a bargain with railway potentates that they would return them, on a pledge that they would bring a line through their borough. Patronage—corruption! I do not know a plea more urgent for taking the whole business of railways out of the hands of railway boards than the

scandalous jobbery their action on the legislature engenders; and it comes to this, either that directors and engineers must be disqualified from entering Parliament, or that the House of Commons will become a mere railway board, to which the great business of the nation will become a secondary consideration. I am not among the number of those who think the danger of the commonwealth lies in the strength of Government. On the contrary, I fear that Government daily grows too weak, and democracy too strong. Ministers, by insisting upon competitive examinations for place, voluntarily resign the advantages of patronage. But in point of fact there is no necessity for giving any patronage to Government in reference to railways. The public might save the whole burden of the pension list, by transferring the half-pay and pensioned servants of the state to the railway service. We might have a fine army on our lines of 120,000 men, without any of the cost. What better station masters could we have than officers in the army? What better engineers than our sappers, our artillery, and royal engineers? What better porters, guards, inspectors, superintendents, traffic managers than our soldiers, commissaries, transport service men? What better pointsmen, plate-layers, levellers, than our gunners, miners, and pioneers? What better employment for engineers, artillery, ordnance surveyors, in time of peace, than in making or repairing the public highways? I am persuaded that the patronage of the railways, were it greater than it is, would not lead to greater corruption in the hands of Government than in those of directors; and that the presence of the latter in parliament, as representatives of so vast an interest, is infinitely more dangerous to the purity of the legislature, and to the public spirit and patriotism of the House of Commons, than the imaginary peril put forward by Mr. Hawes.

I listened with a glow of patriotism to the generous boast of self-congratulation, that private interests were not overborne in the questions of compensation in this country, as they were by foreign governments. For my part, I am satisfied that the enormous plunder extorted from the public by claimants against the companies, can only be controlled by energetic Government interference. When Mr. Hill complained that due allowance had not been made by Mr. Chadwick for the fact that the companies were forced to borrow at six, seven, and eight per cent., the fact he urged was just the case of the public against the directors. They borrow at usurious interest, which they tax their passengers to make up, when the latter, if borrowing the same from the Government, would get that at 3½ per cent. for which the bad credit of private persons has to pay such a much higher rate. Mr. Teulon brought out his old hobby about the extortionate local rates exacted from the companies. Here, again, he only confirms my plea. In the hands of Government the absence of beneficial occupation would cut off all liability to local imposts, and very justly, because, where a line merely runs through a parish, it adds nothing to chargeability, and where it plants a station it gives employment and saves rates by arresting pauperism. As Sir Robert Peel and Mr. Gladstone have both failed to perceive the financial difficulty suggested by Mr. Botley, I may be excused for being equally obtuse. It seems to me that the nominal change of railway shares into government debentures presents no embarrassment whatever. On the contrary, I am very confident that the greater confidence inspired by Government guarantee offers a very fair prospect, by the additional amount of securities thrown on the market, of effecting a reduction in the interest of the national debt. The statements of Mr. Allport I may safely leave to their own refutation. When he informs us that he is obliged "to charge such rates as would develop the resources of the district," he unconsciously betrays the cardinal vice of private management. Industry is no doubt sensible of the honour of his patronage

in "encouraging the development of a particular manufacture," and of his considerate favour for the "pig iron" trade. Perhaps, however, our merchants and manufacturers may be of opinion that common carriers ought to be the servants of trade, not its masters—that it is absolutely monstrous to think that railway traffic managers have it in their power, by discretionary manipulation of their tariff, to make commerce ebb and flow at their pleasure, and to alter its whole current as it may suit their profit or convenience; and that the assumption of these dangerous pretensions, which are derived entirely from powers of making arbitrary variations in the scale of charges, can only be effectually rebuked by Government resuming functions it ought never to have abdicated, and dealing equal justice to all its subjects by adding a uniform rate of carriage to a uniform rate of postage.—I am, &c.,

SIDNEY SMITH.

31, Bush-lane, Cannon-street, 16th Feb., 1866.

QUARANTINE AT CONSTANTINOPLE.—SIR,—I arrived here, with other passengers, from Alexandria, Smyrna, and other ports, on Monday morning, and after several hours' delay, we found ourselves placed in quarantine, on the ground that there were aboard ten packages of salted cowhides from Alexandria, put on board with a special patent of the health officers there. H.B.M. Consul-General interested himself in the case, but our appeal failed. On the personal annoyance of this imprisonment, I do not trouble you, but on general principles. In this case we (the passengers) are subjected to quarantine in a case of epizooty; and have been exposed to inconvenience in this inclement season, by being removed from the cabins during their purification. We did not see the hides till they were put on board. It is not to be supposed that we have had the epizooty, or that we are going to visit the cows of Constantinople. Had we been first-class cows instead of first-class passengers, the propriety of the measure might have been more admissible. As in all such continental regulations, for this is not Turkish, but from an international commission, police considerations enter. Hence we are punished for an infraction of quarantine regulations. As we knew not of the cattle hides, and the steamer had received free pratique from our ports of embarkation, we are the victims, and the innocent are punished for the guilty; this is, however, perfectly *en règle*, according to continental notions. As this infringement did not affect the public health, the usual and the proper course in each violation of simple police regulations is to fine the ship or captain. It is necessary that such regulations, which no doubt prevail in other cities, should be examined and resisted in the interest of the public health, of personal comfort, and of general commerce. If provisions against epizooty are to be imported into general quarantine, and public agents subjected to imprisonment, great suffering and injustice may be the result, more particularly as it is the business of the executive and their native doctors and officials, casually employed for quarantine, to make as much work as they can for themselves and dependents. It is necessary that quarantine regulations should not step beyond the limits of what is necessary for the public security, nor should any penalties be imposed beyond the necessities of police administration. These Constantinople regulations are the result of an international commission of public health, and in conformity with the like regulations elsewhere. The English representative has participated in this regulation, and he is the representative in the International Cholera Congress. As these regulations affect not only health but liberty, and likewise the trade of numerous countries in which we have a large stake, it is necessary that our representatives should be men, regarding not only technical physiological considerations, but capable of appreciating and maintaining our political and commercial interests. These, in regard to cholera and quarantine, have hitherto been altogether sacrificed in the East. During the cholera epoch the internal

trade of Anatolia was annihilated for three or four months, the public treasury exposed to great losses and embarrassments, and English commerce seriously injured. It is to be observed that in this case, although we made a distinct application, we were not heard by the council, but were condemned to imprisonment by the council without a hearing. These regulations are made by men regardless of human liberty and civil rights, and countenanced by individuals too careless to maintain what they esteem to be just. As the International Congress is on the point of meeting, now is the time to act.—I am, &c., HYDE CLARKE.

Egyptian S.S. Tuntali, in the Golden Horn,
Constantinople, Jan. 17, 1866.

WET BRICK WALLS.—SIR,—I live in a red brick house, on a high and exposed situation, and the violent storms of this winter have completely saturated the walls of my house, of course spoiling the paper of my rooms. Can any member of the Society inform me of any preparation to render brick walls impervious to wet?—I am, &c., LEOPOLD PAGET.

Park Home, Wimborne Minster, Feb. 11, 1866.

MEETINGS FOR THE ENSUING WEEK.

- MON.....Entomological, 7.
Medical, 7. General meeting for election of officers and council. 8½. Clinical discussion, and a paper by Dr. Macpherson, "Case of threatened elephantiasis of scrotum in a European."
Asiatic, 3.
Society of Engineers, 7.
Odontological, 8.
Farmers' Club, 5½. Discussion "On the cattle plague, and the Government measures."
R. United Service Inst., 8½. Mr. C. W. Siemens, F.R.S., "The mode of testing electric cables."
Royal Inst., 2. General monthly meeting.
TUES.... Civil Engineers, 8. Discussion upon "The hydraulic lift graving dock."
Pathological, 8.
Anthropological, 8.
Royal Inst., 3. Professor Frankland, F.R.S., "On the non-metallic elements."
Geologists' Assoc., 8.
WED.... Society of Arts, 8. Mr. Coningsby, "On the late Anglo-French Exhibition, with a proposal for the formation of an Anglo-French Association."
Geological, 8. Mr. J. Beete Jukes, F.R.S., "On the carboniferous slate of the North of Devon and South of Ireland."
Pharmaceutical, 8.
R. Society of Literature, 4½.
Archaeological Assoc., 8½.
THURS... Royal, 8½.
Antiquaries, 8½.
Royal Society Club, 6.
Royal Inst., 3. Professor Frankland, F.R.S., "On the non-metallic elements."
Medical. The anniversary meeting at St. James's Hall. Oration at 5. Dinner, 6.30.
FRI..... Astronomical, 8.
Royal Inst., 8. Sir John Lubbock, Bart., "On transformation of insects."
Royal Botanic, 3½.
SAT..... Royal Inst., 3. Rev. G. Henslow, "On systematic and structural botany."

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

- Par.
Numb.
2. Tithe Commutation—Return.
23. Private Bills—Rules.
26. Day of Humiliation—Correspondence.
Jamaica—Further Papers relative to the Disturbances (Part III)
Cattle Plague in Poland—Papers.
New Zealand—Further Papers.
Tobacco, &c.—Reports by Her Majesty's Secretaries of Embassy and Legation.

Delivered on 16th February, 1866.

11. Bills—Church Rates Abolition.
13. " Parliamentary Oaths Amendment.
East India (Indian Officers Commission)—Report of Commissioners.
Public Business—Forms, Rules, Orders, and Proceedings of the House of Commons.

Delivered on 17th February, 1866.

10. Bills—Public Offices (Site).
14. „ County Infirmaries (Ireland).
17. „ Jamaica Government.
20. „ Cattle Plague (as amended in Committee).
21. „ Habeas Corpus Suspension (Ireland).
12. National Gallery—Report of the Keeper.
15. Railway and Canal, &c., Bills—Board of Trade Report.
- 15 (1 to 35). Railway and Canal, &c., Bills—Board of Trade Reports.
17. Court of Chancery—Return.
- Barley—Report of Experiments.

Delivered on 19th February, 1866.

9. Bills—Labouring Classes Dwellings.
22. „ Cattle Diseases (as amended in Committee, and on Re-commitment).
40. Navy Estimates.
41. Greenwich Hospital and School—Estimate.

Delivered on 20th February, 1866.

50. New Zealand War (1865-66)—Supplementary Estimate.
- Education—Revised Code of Regulations.

Delivered on 21st February, 1866.

23. Bill—Telegraph Act Amendment.
54. Police (Counties and Boroughs)—Reports of Inspectors.

Delivered on 22nd February, 1866.

24. Bills—Cattle Plague (amended in Committee, and on Re-commitment).
25. „ Postmaster General.
29. „ Bank Notes (Ireland).
- 15 (36 to 50). Railway and Canal, &c., Bills—Board of Trade Reports.
27. Augmentation of Benefices—Return.
28. Bank of England—Account.
39. Queen Anne's Bounty—Account.
49. Civil Services—Supplementary Estimate.
42. Scientific Institutions and Instruction in Dublin—Minute.
48. Civil Services (1866-67)—Estimates (Class 1 to 7).

Delivered on 23rd February, 1866.

26. Bills—Fellows of Colleges Declarations.
27. „ Artizans' and Labourers' Dwellings.
28. „ Prosecution Expenses.
- 15 (51 to 56, and 125). Railway and Canal, &c., Bills—Board of Trade Reports.
53. Army Estimates (1866-67).
57. General Committee of Elections—Mr. Speaker's Warrant.
61. Army (Colonies)—Statement.
62. Army (Effective Services)—Statement.
- Public General Acts—Caps. I. and II.

Delivered on 24th February, 1866.

31. Bills—Elective Franchise.
32. „ Cattle Plague (amended in Committee, on Re-commitment, and on second Re-commitment).
- 15 (57 to 73). Railway and Canal, &c., Bills—Board of Trade Reports.
30. East India Loan—Return.
55. West India Islands, &c., Relief—Account.

Delivered on 26th February, 1866.

3. Bills—Exchequer and Audit Departments.
15. „ Tests Abolition (Oxford).
34. „ Cattle Plague (amended in Committee, on Re-commitment, on second Re-commitment, and on Consideration of Bill as amended).
37. „ Cattle Diseases (Ireland).
- 15 (74 to 84). Railway and Canal, &c., Bills—Board of Trade Reports.
29. East India (Revenues)—Return.
32. Naval Receipt and Expenditure (1864-65)—Account.
35. Bankruptcy Court—General Return.
36. Duchy of Lancaster—Account.
44. Navy (Dockyard Stock Valuation and on Expenditure on Ships, &c.)—Return.
- Cattle Plague in Poland (1857-65)—Further Papers.

Delivered on 27th February, 1866.

- 15 (85 to 90). Railway and Canal, &c., Bills—Board of Trade Reports.
45. Bills (Education and Religious Denominations)—Statistical Return.
46. Navy (Health)—Statistical Abstract.
52. Colonial Governors—Return.
63. Committee of Selection—First Report.
65. Diseased Sheep and Lambs—Order in Council.
67. Cattle Plague (Ireland)—Report of Committee.
68. Trade and Navigation—Accounts (December 31st, 1865).
- Fisheries (Ireland)—Report of the Special Commissioners.

Patents.*From Commissioners of Patents' Journal, February 23rd.***GRANTS OF PROVISIONAL PROTECTION.**

Boots and shoes, finishing the soles and heels of—251—T. Marshall and H. C. Pretty.
Clay, moulding articles of—344—R. Jobson.

Dishes, &c., making—358—W. Boulton and J. Worthington.
Elastic fabrics—348—C. D. Abel.

Envelopes—340—E. Petit.

Envelopes—360—J. Allen.

Fancy needle-work on canvas, needles used in—378—B. Browne.

Fans, giving motion to—174—A. Bennett.

Fatty and oily bodies, treating—330—G. Gwynne.

Fire-arms, breech-loading—366—J. Gunner.

Fish, catching—193—A. Bryson.

Fluids, filtering—356—T. Spencer.

Furnaces for melting metals—342—P. A. Muntz.

Galvanic batteries—338—A. Horwood and C. Brumbit.

Gas pipes—316—J. Macintosh and W. Boggett.

Ladies' skirts, springs for—334—J. H. Johnson.

Leather fabrics—272—J. H. Brown.

Liquids, decolorising or purifying—258—J. M. A. Montclar.

Liquids, measuring—372—W. Richards.

Metal bands, connecting the ends of—320—H. C. Lucy.

Motive power—359—V. Rastouin.

Paper—332—H. Larkin and R. Purkis.

Papers, embossing in colours on—296—J. Ingram and J. Gough.

Paraffin wax, purification and hardening of—322—W. B. Nation.

Photography, producing printing surfaces by—324—D. Winstanley.

Printing ink—367—S. Holmes.

Reaping and mowing machines—368—R. Sims, J. Beard, and R. Burns.

Railway and other carriages—369—U. Scott.

Railway carriages, axle-boxes for—362—E. A. H. Beuther.

Railway carriages, axles for—374—A. H. Brandon.

Railway carriages, construction and lighting of—364—R. Clark.

Railways, obtaining adhesion of the driving wheels of locomotive engines to the rails of—326—C. H. Holt.

Railway trains, electric intercommunication in—347—C. V. Walker.

Steam boilers, furnaces for—336—T. Molden.

Steam engines, regulating the supply of steam to—371—C. D. Abel.

Steam vessels—256—J. H. Johnson.

Ships' compasses, preventing oscillation in—353—W. Renney.

Time-keeper for watchmen—164—H., E., and L. Abenheim.

Valenciennes lace in twist lace machines, making—350—W. Spencer and T. B. Cutts.

Vessels, propelling—270—J. Howden.

Weaving, looms for—318—J. and J. Bulcock, jun.

Yarns or threads previous to dyeing, treatment of—314—J. Mallison.

INVENTION WITH COMPLETE SPECIFICATION FILED.

Photography, producing printing surfaces by—469—M. Henry.

PATENTS SEALED.

- | | |
|---------------------------------------|----------------------------------|
| 2192. F. Hazeldine. | 2238. E. Cowpe and D. Hancock. |
| 2194. J. A. Wanklyn. | 2239. M. Woodfield. |
| 2209. S. T. Jones. | 2244. H. C. Ash. |
| 2213. W. P. Piggott. | 2254. J. M. Carter. |
| 2214. R. T. Holmes. | 2257. W. Clark. |
| 2216. A. Gurlt. | 2264. W. Barford and T. Perkins. |
| 2217. R. Laming. | 2266. C. Keichen. |
| 2220. W. H. Gummer. | 2267. H. Ellis. |
| 2224. G. F. White and H. Chamberlain. | 2294. J. M. Hart. |
| 2226. W. Brookes. | 2348. S. Fox. |
| 2227. J. C. Green. | 2386. J. Fletcher. |
| 2229. W. Crookes. | 2482. C. H. L. Wintzer. |
| 2233. W. H. P. Gore. | 2524. D. Grieg and R. Burton. |
| 2235. S. and S. Gilbert, jun. | 2948. J. de la Haye. |

*From Commissioners of Patents' Journal, February 27th.***PATENTS SEALED.**

- | | |
|---|--|
| 1971. T. D. Stetson. | 2359. E. T. Read. |
| 2263. J. Elverson. | 2466. W. E. Newton. |
| 2269. J. Drabble. | 2496. W. E. Newton. |
| 2270. S. Kettle. | 2654. W. J. Armitage, F. Wooler, and J. Hodgson. |
| 2272. J. Howard, W. Stafford, and W. P. McCallum. | 2771. T. Greenwood. |
| 2274. R. A. Brooman. | 2872. G. A. Jasper. |
| 2278. J. Neat and F. Ford. | 2881. N. Beard and J. Maiden. |
| 2280. T. B. Bailey. | 2921. H. C. Davis. |
| 2296. J. Dawson. | 3013. E. G. Lamson. |
| 2297. W. Oldham. | 3065. G. K. Snow. |
| 2300. W. L. Wise. | 3334. G. and D. Hurn. |
| 2304. J. and W. Weems. | 26. A. V. Newton. |
| 2355. J. Wakefield. | |

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

- | | |
|-----------------------------|--------------------|
| 462. C. Billingsley. | 542. J. Yates. |
| 479. W. Wood. | 494. J. Tatham. |
| 518. R. Maynard. | 516. H. Wilde. |
| 471. C. Malpas. | 547. R. J. Nodder. |
| 490. J. D. and A. P. Welch. | 564. W. Hadfield. |
| 512. R. W. Thomson. | |

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

- | | |
|-------------------|------------------------------|
| 412. J. L. Clark. | 514. T. and R. Fielden, jun. |
| 490. S. Ridge. | 506. J. Dale. |
| 491. W. Ashton. | 412. J. L. Clark. |